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ABSTRACT

The U.S. Department of Education awarded 19 Challenge Grants for Technology in Education in fiscal year 1995 and an additional 24 in fiscal year 1996. These large-scale development projects are intended to mobilize resources, develop technology-enabled learning environments, and provide lessons to others seeking to make effective use of technology in education. Each grantee is required to conduct a project evaluation. This sourcebook provides guidance and materials to support the development and implementation of evaluations by Challenge Grant project managers and evaluators. Since project proposals vary greatly, the sourcebook provides an over-arching approach to managing the evaluation process to make the most use out of the information being produced to improve project outcomes. Each project should have a single evaluation effort beginning during the planning stage and integrally involved throughout its operations. The evaluation provides: (1) the means for developing and communicating expectations; (2) regular feedback to project leaders and other participants; (3) documentation of project outcomes and lessons learned; and (4) accountability to funders and key stakeholders. The sourcebook covers: evaluation as a part of planning and improvement; evaluation design issues; tracking and documenting progress using portfolios; and guidance for managers and evaluators. Appendices include formats, templates, and an example progress portfolio; annotated bibliography on educational evaluation; list of contacts; and sample planning and data collection instruments. (Contains 28 references.) (SWC)

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Evaluating Challenge Grants for Technology in Education

A Sourcebook

Susan Bodilly, Karen J. Mitchell

Critical Technologies Institute

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*Evaluating Challenge
Grants for Technology
in Education*

A Sourcebook

Susan Bodilly, Karen J. Mitchell

*Prepared for the
U.S. Department of Education*

Critical Technologies Institute

PREFACE

The U.S. Department of Education, through its program of Challenge Grants for Technology in Education, funded nineteen consortium projects in fiscal year 1995 to encourage improved student outcomes through the use of educational technologies. It funded an additional 24 projects in fiscal year 1996. As stated in the guidelines for Challenge Grant applications, projects "should be prepared to conduct careful evaluations of educational effectiveness at every stage of the effort."

The Challenge Grants support large-scale, developmental efforts by districts to apply technology to improving educational outcomes in real settings. This is a sourcebook on evaluation to aid the Challenge Grant project managers and evaluators in the design and implementation of their evaluations to make them appropriate to the setting, goals, and resources of the Challenge Grants. As such, the primary audience is the Challenge Grant project managers and evaluators. However, others interested in the evaluation of large-scale, developmental projects in real settings will also find the sourcebook of interest.

The sourcebook has been prepared by the RAND Critical Technologies Institute (CTI), based in part on prior CTI and RAND work on a federal educational technology strategy and an evaluation for the Office of Science and Technology Policy and the Committee on Education and Training of the National Science and Technology Council. CTI was created in 1991 by an act of Congress. It is a federally funded research and development center (FFRDC) within RAND. CTI's mission is to

- provide analytical support to the Executive Office of the President;
- help decisionmakers understand the likely consequences of their decisions and choose among alternative policies; and
- improve understanding in both the public and private sectors of the ways in which technological efforts can better serve national objectives.

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SUMMARY

The U.S. Department of Education awarded 19 Challenge Grants for Technology in Education in fiscal year 1995. An additional 24 Challenge Grant awards were made in fiscal year 1996. These large-scale development projects are intended to mobilize resources, develop technology-enabled learning environments, and provide lessons to others seeking to make effective use of technology in education. Each grantee is required to carry out a project evaluation and support an evaluation of the total program.

The Challenge Grant Program Office asked RAND to advise it and the project teams about framing and carrying out evaluations. This sourcebook provides guidance and materials to support the development and implementation of evaluations by the project managers and evaluators of the Challenge Grants for Technology in Education.

Review of the Challenge Grant proposals shows that what is being attempted varies among the different grantees, for example, in the target audiences, in the context in which the grant will be undertaken, etc. These variations mean that each grantee must design an evaluation that is suitable to its own particular goals, objectives, and circumstances. Thus, the sourcebook does not offer a single prescriptive design. Instead, it provides an over-arching approach to managing the evaluation to make the most use out of the information being produced to improve project outcomes. It describes an array of issues that project managers must face in designing and implementing an evaluation of technology in education, offers specific evaluation instruments and products in a series of appendices to broaden the range of options grantees might normally consider, and provides concrete examples of others' work in this area.

CONNECTING EVALUATION TO A PLANNING AND IMPROVEMENT PROCESS

Evaluation should be part of each project's planning process. Because resources for evaluation are limited, RAND suggests that for each project there be a single evaluation effort beginning during the

planning of the project and integrally involved throughout its operations. The evaluation component should not be seen as separate from the normal routine of the project; the collection and analysis of information about project progress should be regular and embedded in a self-improvement process. The evaluation serves four distinct purposes by providing:

1. the means for developing and communicating the expectations for results and key milestones toward accomplishing those results;
2. regular, structured, and objective progress information to project leaders and other participants;
3. documentation of project outcomes and lessons learned; and
4. accountability to funders and key stakeholders.

Each of these purposes is described in more detail below.

Means for Developing and Communicating Expectations

Planning the evaluation requires specifying and sharpening the goals of the project, including both outcome goals (in terms of improved student performance) and process goals (in terms of implementation milestones such as equipment installation or staff training). When effectively integrated, evaluation processes can also develop shared expectations among stakeholders concerning when various outcomes will be achieved, thus lessening possible misunderstandings during the course of the project.

Regular Feedback to Project Leaders and Other Participants

The projects supported by the Challenge Grants are developmental, intended to create and demonstrate a variety of potentially effective applications of technology in education. As such they are intended to attempt innovative practices, learn from the attempts, and refine them over time into effective practices. An embedded evaluation activity should provide important and timely feedback to managers and stakeholders to enable them to improve the project and ensure the meeting of project goals. In particular, feedback of the results of early "formative" evaluation to project leaders can provide information

on accomplishments relative to plans and expectations. Project leaders and the implementing staffs can use this information to modify and improve their development efforts. Later in the project, reports on student and other outcomes to project managers and implementers will allow them to compare those outcomes with goals and to adjust the project design and implementation to improve outcomes.

Documentation of Project Outcomes and Lessons Learned

Documentation of outcomes and lessons serves three purposes: marketing the project to mobilize a wide variety of local resources and commitments to improve education through the effective use of technology; demonstrating that such uses of technology will lead to improved student outcomes; and providing lessons about project design and implementation that other communities and Challenge Grant recipients might use to improve educational outcomes. These purposes require documenting the projects' evaluation and accomplishments in forms that are useful to several audiences.

Accountability to Funders and Key Stakeholders

Reports of the evaluation, together with actions taken to deal with shortfalls in implementation and performance relative to initial goals, provide an opportunity to engage relevant publics in the development and demonstration efforts. Through such reports, the project leadership provides an account of its activities to its stakeholders--those actors such as government and other funders, school administrators, teachers, students, and parents who are engaged in or affected by the project. Engagement of these groups is critical to achieving significant educational change.

KEY ISSUES EVALUATIONS MUST ADDRESS

The projects supported by the Challenge Grant program vary widely in their objectives, organization, complexity, and scope. Obviously, all involve the application of technology. However, in some projects, technology is only one of many elements of a system-wide reform strategy, while in others the scope of reform is more circumscribed and technology provides a more central focus.

As a consequence, evaluators face a number of challenges in planning and accomplishing their tasks. For instance:

- The outcomes sought are usually complex and not entirely captured by traditional educational measures. For the most part, proposals that were awarded grants seek better learning outcomes on a complex variety of dimensions rather than improvements in traditional test scores. However, the communities that support these projects might place great value on test scores, and therefore projects that ignore test scores might lose public support.
- The causes of performance outcomes are also complex. A project incorporating technology may also include new pedagogical strategies, new curriculum, new assessments, changed amount of time in the school day, and changed school organization. Thus it is impossible to attribute the outcomes of individual projects solely to the use of technology. Consequently, evaluators must try to provide as much information as possible on the key factors that affect the success or failure of a project effort.
- The outcomes of a project are strongly affected by the project's setting. A project's location--in a poor rural area, a depressed urban setting, or a well-off suburban community--affects both its implementation and its effects. External consumers of evaluation information need to understand the context in which a project is implemented.
- The goals of each of the Challenge Grant projects are unique. For that reason, one evaluation design will not fit all. For projects in this program, the evaluators have an unusually important responsibility to be clear concerning the goals of the projects they are evaluating and to select measures of outcomes and implementation consistent with those goals.

APPROACHES TO TRACKING AND DOCUMENTING PROGRESS

The Challenge Grant Program Office is interested in fostering reporting that is consistent with the goals and context of individual projects and that provides information that can be aggregated across projects to help the Program Office describe and justify the program as a whole.

RAND proposes that documentation of the individual projects take the form of a "Progress Portfolio" prepared by each project. The collection of such portfolios would constitute an important part of the accountability of the program to the public. A portfolio allows project managers to provide information on a rich array of outcomes, to describe the project giving rise to these outcomes in adequate detail, to characterize contextual factors, and to reflect on lessons that emerge as the implementation progresses. If the portfolio is treated as a living document, subject to regular revision and updating, it can at least partially serve each of the purposes of the evaluation outlined above: feedback to management, documentation of outcomes and lessons learned, and accountability to funders and key stakeholders. This sourcebook elaborates on the form and purposes of such a portfolio and provides sample worksheets and an example of such a portfolio.

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We would like to thank the U.S. Department of Education's Program Office for the Challenge Grants for Technology in Education for its support, especially Linda Roberts, Thomas Carroll, and Donald Fischer. We would also like to thank the reviewers who aided in making this a better document: Chip Morrison of Bolt, Beranek, and Newman, Inc. and Mark Berends of RAND. Within RAND we would like to thank our colleagues Wally Baer, Thomas Glennan, and Sara Robyn for their support.

Many of the ideas for the approach to evaluation of large-scale education development projects that we advocate here were developed during the RAND evaluation of the New American Schools initiative. We would like to thank the many actors involved in that initiative for their contributions to our current thinking.

1. INTRODUCTION

This introduction provides background about the Challenge Grants, describes the purpose of this sourcebook, and outlines the remainder of the sourcebook.

ORIGINS OF THE CHALLENGE GRANTS

As part of broader school reform efforts aimed at improving student performance and preparing students for the future work force, the federal government has promoted the use of technology in education. One means for doing so is the use of matching grants to local communities. In 1995, the U.S. Department of Education (ED) issued a Request for Proposals (RFP) inviting local consortia comprised minimally of one or more local education agencies to apply for Challenge Grants (i.e., matching grants) to encourage the use of technology to

- strengthen the school reform effort;
- improve student achievement; and
- provide sustained professional development.

Five hundred and thirty proposals were submitted in response to the RFP. After a rigorous review process, ED awarded 19 grants using fiscal year 1995 funds. Another 24 grants were awarded with fiscal year 1996 funds.

A condition of each grant is the development and implementation of an evaluation plan by the local consortium or others acting on its behalf. ED intends that the evaluations yield two types of information. First, each project evaluation should measure the success of the individual project in meeting both its unique goals and the goals common among the projects. Second, taken together the project evaluations should measure the success of the program. (Note that the term "project" is used here to refer to any one of the individual grant recipients, whereas "program" refers to the total of the projects administered by ED under P.L.103-382, Title III, Section 3136.)

NATURE OF THE CHALLENGE GRANTS THAT AFFECT EVALUATION

The Department of Education goals for the evaluation of the Challenge Grants are to (1) ensure that the evaluations are rigorous and stand up to scrutiny; (2) increase the probability of having measurable outcomes; and (3) encourage a set of common indicators or comparable data across projects to enable a rigorous program evaluation.

However, the "real-life" setting of the Challenge Grants, individually as projects and collectively as a program, pose significant evaluation challenges such as:

- The Challenge Grants have been awarded to districts in the midst of complex reforms and facing political obstacles to change. Conditions in the districts will change over time, for some dramatically.
- Challenge Grants are grants for the development of interventions. The interventions are not well defined and are apt to remain in flux for some time.
- Challenge Grants intend to produce complex changes in student performance that are not likely to be significantly measurable for some time.
- Few dollars have been attached to the grants to perform evaluations. Evaluations have been required, but no specific funds set aside for their performance.
- The Challenge Grants vary considerably in goals, objectives, target groups, and geographical settings.

From these realities facing the Challenge grantees, we take the following principles for the evaluation.

- The evaluation approach must be keyed to the particular goals of each project and matched to the real-life setting in which it resides.
- A single prescriptive approach will not apply to the varied needs of the projects, nor will highly formal experimental methods match the constraints of the projects.

- The evaluation must be embedded into the project to reduce costs and ensure it matches the developmental needs of the projects.

PURPOSE OF THIS SOURCEBOOK

At the request ED, RAND developed this sourcebook to encourage project managers to meet the goals listed above, given the realities of the situation. It was generally created to help project managers develop an evaluation that would match the contexts of the projects and explore more fully the evaluation principles just enumerated. This sourcebook was first presented to the original nineteen grantees and then updated for the next round of fiscal year 1996 grantees.

The primary audiences for this sourcebook include (1) project leaders charged with ensuring that the Challenge Grant dollars are put to good use and (2) their evaluators. Its purposes are:

- To argue that evaluation should be part of a solid planning and improvement process and to show how decision makers can use evaluation findings for improving their developmental projects over time.
- To identify issues likely to affect evaluations of education technology projects and that project managers and their evaluators need to face together.
- To suggest performance measures common to all projects, and appropriate means of data collection.
- To describe a tool called a progress portfolio, which projects may use to make their evaluations useful to their different audiences.
- To provide reference materials and specific examples of the types of information to gather in these evaluations.

Note that the sourcebook assumes an informed audience of experienced project managers and evaluators. Thus, rather than focus on detailed methodology issues or pejorative models, it emphasizes larger issues such as how to frame the evaluation to be most useful to a

developing project; what types of evaluation issues are likely to confront the project manager and evaluator; and how to track and present findings to audiences interested in the results of the program. The main sections present our informed judgments about the type of evaluation approaches that are likely to work given the setting of the Challenge Grants. The sourcebook also has extensive appendices that offer an array of instruments, examples of products, indicators, and benchmarks others have developed. Thus, the sourcebook is a reference guide to others' resources or ideas that project managers and evaluators can use to improve their projects and evaluations.

OUTLINE FOR THE REMAINDER OF THE SOURCEBOOK

The next section (Section 2) provides a planning and improvement model for developmental projects, such as the Challenge Grants, to effectively use evaluative information to improve the probability of desired project outcomes. The remainder of the report refers back to this model. Section 3 provides an overview of evaluation issues facing those responsible for the Challenge Grant projects, with examples from or applications to education technology projects. Section 4 then describes a progress portfolio and its connection to the planning and improvement model described above. Section 5 describes how the Challenge Grant project managers and evaluators can use the material in the appendices that follow.

These appendices are an important part of this sourcebook. They provide the reference materials that should be useful to project managers and evaluators in the construction of their evaluation designs and in the implementation of those designs. Appendix A contains illustrative templates for a progress portfolio. Appendix B is an annotated bibliography. Appendix C lists contacts for each Challenge Grant, including websites, as of the date of publication.

Appendix D contains sample instrumentation for various types of data collection. These are real evaluation instruments and products that we came across or developed in the course of RAND projects. The examples come from projects with some similarity to the Challenge Grants and from reputable school reformers or evaluators. The Challenge Grant

projects can refer to them for "real" examples from evaluations of complex school-based reforms.

Appendix E is an example of a progress portfolio developed by a design team associated with the New American Schools (NAS)¹.

¹New American Schools funded the creation of whole-school designs and teams dedicated to transforming schools according to those designs. We use examples from this private, non-profit effort only as illustrative, not as defining.

2. EVALUATION AS PART OF A PLANNING AND IMPROVEMENT PROCESS

The Challenge Grant projects are in a developmental stage. They are not yet fully specified, and are expected to change during their lifetime as participants learn how to more effectively use technology to support improved student outcomes. In addition, they have been awarded to districts that are often in the midst of complex reforms and are facing political obstacles to change. Conditions in the districts will change over time, some dramatically. Finally, evaluations have been required, but no specific funds set aside for their performance.

Under these circumstances, the benefits of evaluation can be maximized only when it is used as a tool in a structured improvement process to provide useful and timely information and when such information is used to revise project activities that can increase the probability of meeting desired project outcomes. In short, evaluation must become embedded in a self-improvement process, based in planning, that promotes the tracking of progress over time to promote better decision-making. Herman and Winters (1992, p. 9) have put the notion succinctly:

Evaluation information alone cannot solve problems; only thoughtful and empowered educators will solve problems. The power of evaluation rests in its ability to help people identify where they are going, how to improve the journey, and whether they have arrived. It is a process for communicating, building support, and developing a shared vision among the school community.

We call this a planning and improvement process. It is intended to provide answers to the following types of questions.

- What are the causal assumptions underlying the project activities?
- Are the interventions being implemented and are they observable in the school, home, community?

- Which activities and strategies are aiding participants' progress toward goals?
- Which activities and strategies are impeding progress toward project goals?
- Are students and adult participants benefiting from project activities and strategies?
- What do progress levels (and aids and impediments) suggest about upcoming work and continuing project improvement?

The crucial point is that, to succeed projects must systematically gather useful information related to progress toward interventions and student performance, and regularly use it to improve the project. The development, collection, and analysis of project information should be part of the planning process from the beginning of the project.

COMPONENTS OF A PLANNING AND IMPROVEMENT PROCESS

Organizations rely on planning processes to better achieve their goals and to function in times of uncertainty or when faced with major challenges. The project planning and improvement process has four components: design, implementation, evaluation, and improvement (as shown in the four boxes in Figure 2.1). Despite the linear quality of the figure, these are iterative, and not wholly separable, components. These components have associated functions or activities listed in each box and discussed below.

Create a Vision and Set Goals (Box 1)

The first step in the planning and execution of a project is to create a vision of where the project wants to be in three to five years. Implicitly, the project is trying to change current circumstances to some more desirable state. This implies that part of the process of goal setting must be a review of current needs, conditions, threats and opportunities. Only after a needs assessment can the participants agree on realistic and relevant goals and objectives. The project's vision will include specific goals and objectives for different actors. To ensure that the vision actually has a chance of being carried out the actors who will have a strong role in implementing and supporting the

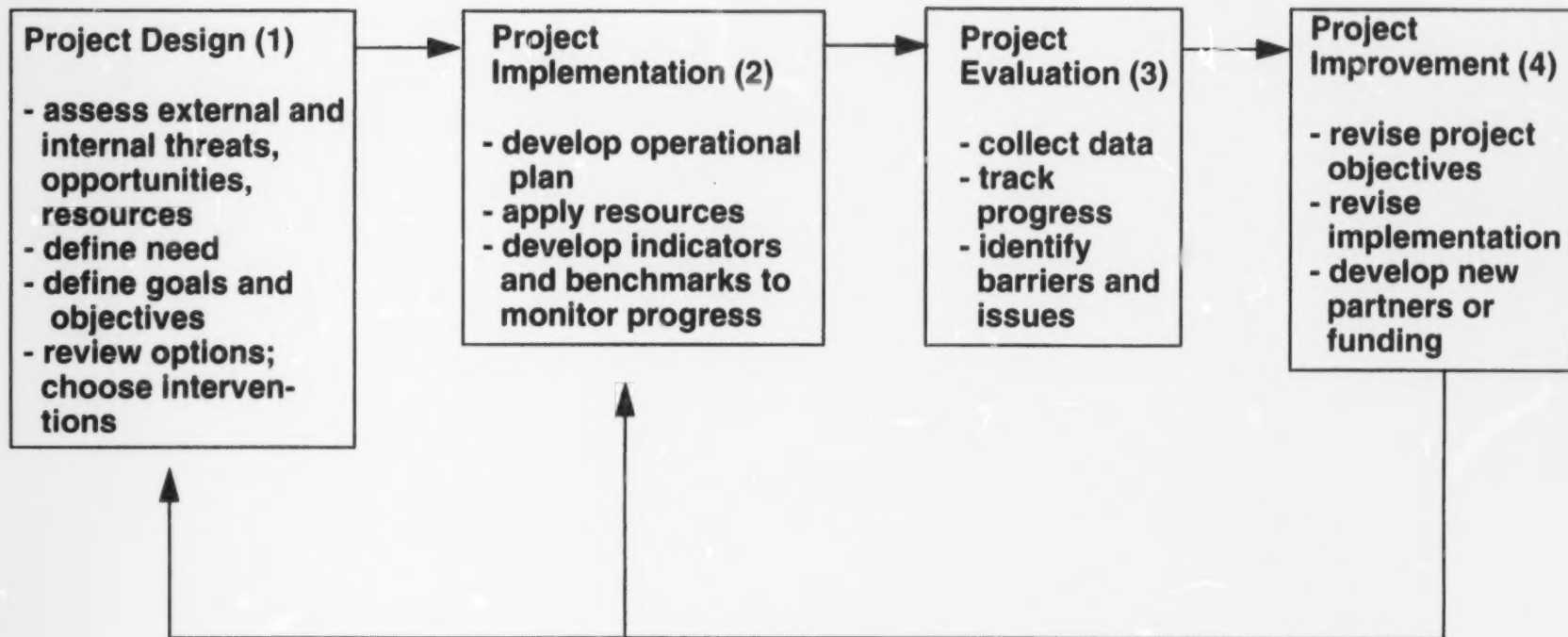


Figure 2.1--Project Improvement Process

vision should be involved. The outcome of an interactive and participatory process of goal setting should be a mission statement focused on an identified need or set of needs and a set of objectives agreed to by the project's principal stakeholders.

Choose Interventions (Box 1)

Given the needs and goals, the project manager and his or her staff can begin to discuss and review different options for interventions. These options should logically relate the program objectives to the program activities. In many cases the grant proposals already have stated activities, but these can be continually reviewed and updated to meet new circumstances.

Create and Deploy an Operating Plan and Implementation Process (Box 2)

After choosing interventions, the project managers must develop an operating plan and set in motion an implementation process. This would include developing plans for specific resource allocations, governance, training, curriculum development, quality review of project products, reporting, etc.

This operating plan should also include the development of indicators and benchmarks to guide the effort. In other words, it should state how the managers will know if they are making progress (indicators). Indicators are the measurable or observable means for identifying progress; many are listed in the appendices. The plan should also state when progress will be checked as well as expectations for accomplishment (benchmarks). Benchmarks associate a time frame with indicators to let project participants know what is expected of them and when. Indicators and benchmarks can track the outcomes of implementation processes such as the number of computers bought, the number of teachers trained, whether a committee was formed, or the number of curriculum units developed. They can also track progress on quality such as whether the curriculum units developed met the standards that the project has developed or whether new instructional techniques adopted by teachers in classrooms meet a standard of good practice. Finally, indicators and benchmarks can refer to expected performances such as student test scores, attendance rates, or continuation rates.

Create and Deploy an Evaluation Process (Box 3)

The next step in the process is to establish the evaluation plan and carry it out. Obviously it should be linked to and appropriate for the objectives, indicators, and benchmarks developed previously. Evaluators must use judgment to determine what is the best model or approach for their particular project needs; there are many guides for these decisions, some of which are mentioned in Appendix B. Decisions will depend on the particular goals, objectives, indicators, and benchmarks, as well as the resources and time available.

An important part of the dialog between the project manager and the evaluator is consideration of what the main focus of the evaluation will be. Educational reform efforts are undertaken in complex environments with multiple goals. This means that there could be endless indicators and benchmarks to track. But resources are always limited. Thus, a crucial decision is to determine what the focus of the evaluation should be. This decision should be informed by the main goals of the project after discussion among stakeholders.

The evaluative data produced should be useful during the course of the development project to help improve the likelihood of desired outcomes. An after-the-fact analysis will not benefit a developing project. This means that the project managers and evaluators must agree on the near-term indicators and benchmarks and the longer term indicators and benchmarks. They must also agree on regular reporting and routine updates of evaluative information.

Provide Feedback and Take Actions (Box 4)

As stated above, the evaluation is useful only if it provides timely inputs into decisions on how to proceed and how to improve outcomes. Thus, the last step in the iterative cycle is to provide the evaluative information to the decision makers who can take appropriate actions on whether to continue on as usual, make major adjustments in project activities, or even terminate the project. At this point new near-term objectives can be set and action plans revised to meet the current conditions.

USES OF CHALLENGE GRANT EVALUATIVE INFORMATION

For the Challenge Grant projects, the evaluative information collected in the generic planning and improvement process just described can be used in several different ways by different stakeholders as shown in Figure 2.2.

(A) **Internal Project Leaders.** Evaluation information produced on a regular basis can be used by project leaders to adjust the project over time to improve the implementation and increase the likelihood of obtaining the desired outcomes.

(B) **Community/Local Consortia Participants.** Evaluation information can help consortium members increase the effectiveness of their participation. Evaluation results can be used to garner further support within the community and to attract additional funding for the project.

(C) **Federal Funders.** Evaluation information can be used by ED and the U.S. Congress to determine the extent to which the program should receive additional funding, whether and what changes should be made, and whether new projects should be added to the Challenge Grant program.

(D) **Broader Education Community.** Through evaluation of the activities associated with the grants, ED hopes to understand which approaches work to promote technology use and ultimately better student outcomes, and to disseminate these findings to other local communities to improve the nation's educational system.

Thus, the requirement in the RFP for evaluation of the projects was meant as a positive step to increase the likelihood of project success, to ensure public review of the program supported by objective evidence, and to provide information to the stakeholders and broader public for judging whether or not to adopt any of the project models.

INFORMATION REQUIREMENTS FOR BETTER PLANNING

The information needed for tracking, analysis, and feedback falls into three major categories: (1) intervention or project activity information; (2) data on progress toward benchmarks on implementation processes, quality of products, and results--performance indicators; and (3) data that describe important environmental or contextual factors

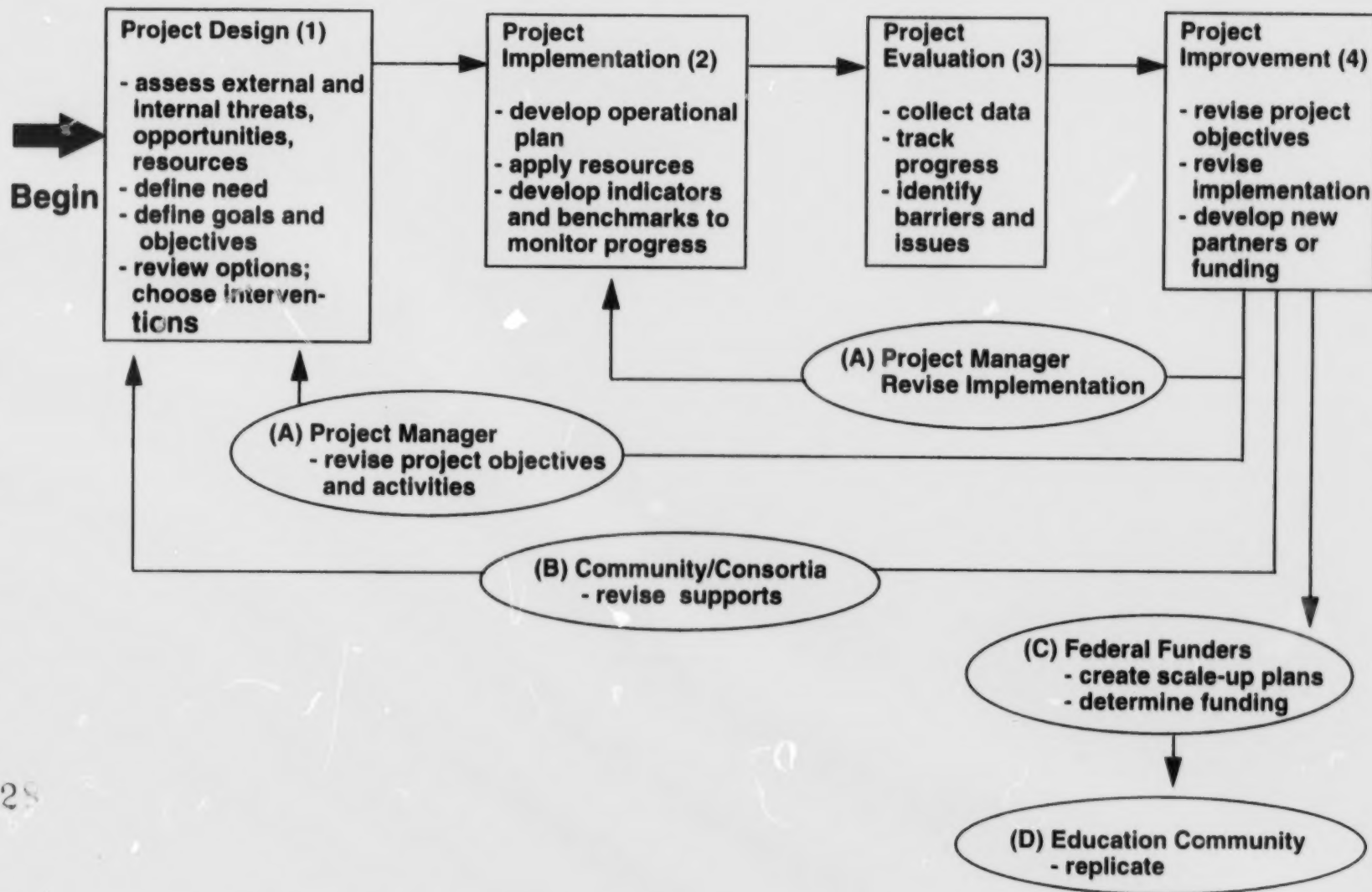


Figure 2.2--Stakeholders and Decisions in Project Improvement Process

that might affect project outcomes. Some of these data are developed during the planning steps prior to evaluation. Because the indicators in category 2 are geared to expectations over time, some can be seen as interim, others are final.

Evaluative data should provide information to the interested audiences about whether or not the project activities enabled sites to meet the goals and objectives set out. The following paragraphs describe briefly each of these categories of data. Further details about the categories of information, their uses, and actual examples are found in later sections and in the appendices.

Interventions or Project Activity Information

This category includes defined activities or program interventions such as the deployment of computers or software in the classroom, delivery of computers to children in their homes, the building of network capability, additional professional development for teachers, or provision of training in curriculum writing. Managers use these data about the proposed treatment to determine what to measure to judge whether the project activity is having the desired effect.

Context Information

Contextual information is used in the evaluation to examine outcomes in relation to external or exogenous variables other than the project activity (treatment), such as demographic characteristics of the student population, funding levels, competing projects or new initiatives, and political support. For example, project managers might be interested in knowing if student characteristics such as family income, grade level, or familiarity with English have any effect on the outcome. Using this information, project managers can design projects targeted to the special needs of particular groups.

Information on Progress

This includes several types of data, including progress on processes of implementation and the quality of that implementation and performance or outcomes--both interim and final.

Progress Toward Implementation. Implementation data document observable actions or products that indicate whether the project is being implemented as planned. These indicators are specified in the operations or implementation plan with benchmarks and included in the evaluation design as indicators to be tracked over time. They might include:

- number of computers actually purchased, location of computers purchased (i.e., percent in schools versus homes)
- number of new members in a consortium
- level of matching funds raised
- number of teachers receiving training
- changes in classroom activities, in adult-to-youth interactions, and in the attitude of teachers and parents toward computer usage.
- products such as units of curriculum, units on the network, new assessments, or sites on the World Wide Web (WWW), and how many times they were accessed.

While it is important to simply track the progress made, it is just as important to track the quality of the progress. For example, some assessment might be made of the quality of the units of curriculum developed or the quality of the professional development.

Evaluators use this information to judge whether the program was implemented at the level of quality intended and had the desired effect. Without measurable implementation indicators of both quantity and quality, the evaluators cannot effectively relate program activities to performance outcomes.

Progress Toward Performance Outcomes. These are measurable changes in the variables most closely associated with desired final project outcomes. Data on early outcomes indicate whether the project is heading toward the desired outcomes. These interim measures can help project managers take early action to ameliorate problems and improve project outcomes. Data might include short-term changes in student

outcomes such as test scores, disciplinary referrals, or homework assignments completed.

Final or long-term project performance indicators might include:

(1) proximate outcomes such as changes in test scores or student performances; and (2) outcomes that are associated with long-term effects of the project such as an increase in college-going rates or an increase in job offers to students in the project.

TRACKING AND DOCUMENTING PROGRESS

Tools are available to help project planners and evaluators track progress over time for both internal and external consumption. One such tool that might be helpful to Challenge Grant managers is a progress portfolio. The portfolio is a document that provides a longitudinal record of progress in relation to the project's goals, objectives, and benchmarks for progress; it describes the work of participants as the project progresses. It offers ongoing suggestions for realignment of upcoming goals and recommendations for future work. The process of creating the portfolio is akin to the planning and improvement process we described above. See Section 4 for details.

3. EVALUATION DESIGN ISSUES FOR CHALLENGE GRANT PROJECTS

Some projects have characteristics that promote the probability that the evaluator will be able to measure the project impact in practical and meaningful ways. Several recent evaluations of educational technology projects point to benefits associated with the adoption of specific computer-based learning systems such as Computer Assisted or Aided Instruction (CAI) tutorials and higher-order thinking skills programs (Herman, 1995). These programs and their evaluations followed good sense evaluation rules or procedures that increased the probability that effects would be observable including: well-specified interventions and desired program outcomes, program outcomes that were conducive to being measured, the use of controls to understand the effect of different variables, and a long enough timeline to observe results.

Herman (1995) and Means (1995) report that the benefits of broader based education technology projects have been less apparent or measurable. Broad-based reforms attempt multiple changes in a school besides the insertion of a single computer-based course. They might attempt to create a constructivist curriculum across all grades and in part supported by computer technology, or they might attempt new technology use in conjunction with major restructuring. Efforts to trace the effects of these projects must take into account measuring effects in dynamic situations where many variables cannot be controlled and where interventions and outcomes have not been well defined for measurement.

The Challenge Grant projects have the same characteristics as the projects described by Herman and Means (1995) and thus pose significant evaluation challenges. This section is designed to inform managers and evaluators about issues that must be faced. It reviews the macro-level issues resulting from the nature of the Challenge Grants, especially evaluation design issues common to education technology projects. The section serves to open up discussions between project managers and

evaluators over what can actually be accomplished in the context of the Challenge Grant program.

We cover the following issues: trade-offs between evaluation and other project needs, matching the evaluation to the project's goals, evolving goals over time, technology as a minor part of a larger reform effort, the ambitiousness of the project goals compared to the intervention, lack of project implementation, the complexity of outcomes sought, the timing of expected outcomes, and the prospect of changes in target groups over time. For additional details on these issues, the reader should refer to the original reports listed in Appendix B.

TRADE-OFFS BETWEEN EVALUATION AND OTHER PROJECT NEEDS

The Challenge Grants have limited resources to carry out the evaluation. And they face internal conflict: the more they spend on evaluation, the less they spend on actual project interventions. Taken together, measurement difficulties and limited resources pose challenges, but not necessarily insurmountable ones.

In addition, the projects face funding issues. Congress originally appropriated \$27 million in fiscal year 1995, but rescission brought the final appropriation to \$9.5M. The five-year budget for the program is not fully funded and the number of new grants made available depend on the level of Congressional appropriations. The implication is that the projects will probably be under pressure to show early results to justify full funding or further funding. This will likely make the collection of implementation and interim outcome information important to project managers for both internal and external audiences.

Because the evaluations are directly funded with project dollars, project managers must make a trade-off between funding the project and funding the evaluation. Thus it is particularly important for evaluators to find ways to make the evaluations worthwhile to the project leadership through timely reporting of information that helps with project improvement.

We emphasize that resource constraints will force project managers and evaluators to make tough choices. They should bear in mind the basics of the model of planning and improvement we are advocating:

Focus the evaluation and embed the evaluation in normal planning processes if possible to maximize its usefulness to the success of the project.

CHALLENGE OF MATCHING THE EVALUATIONS TO PROJECT GOALS

A primary responsibility of the evaluator is to design the evaluation to suit the unique characteristics of the project. We have emphasized already how important statements of project goals, objectives, and activities are to the proper development of an evaluation effort. Within the Challenge Grant program, the projects have varying objectives and interventions that must be taken into account by evaluators.

All Challenge Grants have a common goal: improving student performance. However, content analysis of the grant proposals indicates that the specific objectives or means for achieving that ultimate goal vary by project largely because the problems faced in each community in achieving that goal differ. Two real but unnamed examples give an indication of the variance.

Proposal A describes its community problem as rural children having limited exposure to the arts because of their geographic distance from museums and performing art centers largely located in the nation's urban centers. By not having easy access to these cultural centers, rural children lack some of the educational opportunities available to others, especially those peers living in closer proximity to cultural centers. The solution offered by the proposal is the development of an electronically based network of art curricula that can be integrated with other subjects to be shared among schools in several rural counties; it also plans professional development for teachers to become experts in the delivery of those curricula. The partners include (among others) museums and other art centers. In short, the project will use new communication technologies to reduce the importance of geography in viewing and experiencing the arts.

Proposal B focuses on poor achievement of disadvantaged urban students in terms of new standards developed by the state in all disciplines. The solution presented is to use computers to increase by

one-third the time-on-task in challenging curricula for disadvantaged students. This will be accomplished by increasing the number of computers in classrooms to one per four students, providing a home computer for disadvantaged children at the elementary level, developing new curricula that meet new state standards, and training both teachers and parents to help children access the computers and curricula.

The implications for designing an evaluation for each of these projects differ. First, these two proposals, while both geared toward higher student performance, would use different measures of desired outcomes. Proposal A would focus on increases in cultural knowledge. Proposal B would focus on improved scores on state-mandated tests that reflect the new state standards. The projects also intend effects on different types of students: rural students in Proposal A and urban disadvantaged in Proposal B. Interim measures of progress geared to implementation processes would vary substantially. Proposal A might use interim indicators such as numbers of units of curriculum developed or numbers of teachers trained, while proposal B might focus on numbers of computers bought and their use, on increases in time-on-task by students using computers, and on numbers of teachers and parents trained in computer usage. Indicators geared to quality would be essential for both, as both intend to develop curricula and the new units of study would have to be reviewed. However, the standards or criteria for review would differ substantially for each project.

EVOLVING PROJECT GOALS AND INTERVENTIONS

The objectives and activities of educational technology projects often evolve as teachers learn to use the new technology in more sophisticated ways, as technology itself changes, and as the school's needs change. These changes affect the ability to measure outcomes. Assume, for instance, that the technology itself is rapidly changing and that the schools attempt to keep pace with these changes. New equipment and software change the capabilities and the intervention. This in turn changes the ability to produce the desired outcomes and sometimes even changes the outcomes desired. Over several years, the currently desired

outcome and the one being measured from the baseline might no longer match.

This is likely to happen in the Challenge Grant projects. Several projects intend to develop a funding consortium to increase investments in computers in classrooms or homes. Adding new consortium members in an effort to increase investment funds is a likely part of the growth of these projects. However, the addition of members comes at a potential cost. Each new member potentially adds its specific goals to the consortium. Over time, the goals and objectives of the consortium might change due to new members' interests, political realities in the community, or through deliberate revisions by the participants.

The changes in objectives or the addition of new objectives must be taken into account. Evaluation methods and the design must adapt to the changing project conditions. Evaluators must remain aware of the evolving nature of the consortium and be prepared to adapt the original objectives and indicators in dynamic circumstances.

TECHNOLOGY AS A COMPONENT OF COMPLEX EDUCATIONAL ENVIRONMENTS

The environment for education technology projects is usually highly complex, and often the technology component is not the major thrust of the reform. Rather, it is one of many reforms taking place at once. Many influences, other than the technology activity, may confound the simple cause-and-effect relationships hypothesized for education technology. The complex environments in which the technology projects are embedded make inference of causal relations between project activities and outcomes tenuous.

Several Challenge Grant projects are part of strong state or district reform efforts aimed at improving school outcomes. Along with the Challenge Grant projects, other school-level reforms will be undertaken, such as the adoption of new standards for achievement, adoption of new curriculum frameworks, increases in professional development funding, etc. These, like the Challenge Grant activities, are intended to change student outcomes. In these circumstances evaluators and project managers must accept that it will be very difficult, if not impossible, to disentangle the effects of the

Challenge Grant on student achievement from the myriad effects of the other reforms.

Given this reality, the research design or expectations for conclusive results must be modified appropriately. In some cases, the effects of the project activities might be better understood through the use of controls or comparison groups. If this is not cost-efficient or runs counter to the reform, then an alternative is to use contextual analysis to try to understand the contribution of the technology to the outcomes observed. It is important to avoid attributing outcomes solely to the effect of technology. In these instances, implementation analysis will be particularly important to establish how and to what degree the reforms were implemented. Participants' judgments can be used to understand their thinking about what contributed to outcomes.

AMBITIOUS PROJECT GOALS

Technology projects, and indeed most education reforms, are undertaken in a climate of political bargaining that requires project leaders to pose ambitious and broad goals in order to garner political support. This requirement makes it likely that technology projects and their activities may not be able to meet the ambitious project goals set for them.

This circumstance is often referred to in the abstract as a weak intervention, which means that the treatment provided by the project activity is small relative to the treatments provided by non-project influences. Thus, the effect of the external influences overwhelms any change resulting from the project intervention.

For example, several proposals from urban districts that target disadvantaged children intend to increase the use of computer-based educational technology to combat low student achievement. These projects are likely to have less impact than the family or neighborhood circumstances of the children, the influences of peers and friends, poverty, violence, or community upheaval. These contextual influences are likely to have stronger effects on student achievement than the project intervention. When this is the case, the project is said to be a weak intervention relative to the other influences on the child. One

should expect, all other issues of evaluation aside, that the gain in outcomes would be minimal even if the program is solidly executed.

In general, the goal of the Challenge Grant projects is to improve student performance. This is an ambitious goal, considering the many problems that children face in attempting to achieve in school. The Challenge projects are only one of many interventions that would be needed to meet the stated goal of the program and to address the problems faced by children in meeting that goal. As such the goal should be considered ambitious in light of the interventions, or the interventions weak in light of the goal.

However, the project's intervention is weak only when compared to the ambitious goals required by the political climate. Project evaluators have an important role in setting realistic expectations for outcomes. The evaluator can challenge the project manager to formulate an appropriate match between the activities and the goals of the project. The solution, as politically unappealing as it might be, is to reframe the goals and make them more proportional to the actual resources, activities, and other constraints being faced.

LACK OF PROJECT IMPLEMENTATION

On the other hand, some projects are never implemented or are poorly implemented because of lack of relevant training and support to teachers to implement new, technology-based curricula. Projects not put in place will have no measurable effects. Lack of implementation leads to the same small change in outcome and performance indicators as a weak intervention, but its causes are different. Distinguishing between weak interventions and poor implementation is important from the point of view of the project managers, who would take different actions depending on the cause. For this reason, evaluators should encourage an implementation analysis, and they should gauge that analysis against benchmarks developed as part of an operational plan. This is the first step in ensuring that any measurable effects are due to the implementation of the project. To ensure that the effects are solely due to the project and that other factors did not contribute to them often requires control or comparison groups.

EVALUATION OF PROJECTS SEEKING COMPLEX OUTCOMES

Another evaluation issue raised in education technology projects is the probability that technology usage might not directly affect the standard outcomes used in education evaluations such as student test scores. For example, several projects intend to use technology to deliver curricula designed to promote higher order thinking skills, more sophisticated communication skills, research skills, and social skills. These skills are not usually assessed with multiple choice or "bubble" tests commonly used in districts. Rather, the evaluation design must develop outcome measures geared to the specific skill development goals of the project. The indicators might be much more complex than multiple choice test scores.

This poses a greater problem for projects that have not adequately described their desired outcomes. Those projects should revisit the first planning step to identify specific objectives and project activities to configure the evaluation in appropriate ways.

For another set of projects--those desiring complex changes on multiple fronts--the challenge of creating outcome measures is more formidable, but not insurmountable. These projects tend to be aligned with districts that are in the midst of significant reforms. Part of those reforms usually include revision of the assessment system to reflect the desired student performance. Thus, the issue of appropriate assessment might be a short-term one. As the districts develop more performance-based assessments the issue will disappear.

If the district is not undergoing this process, an alternative exists. Several states--such as Vermont, Kentucky, and Maryland--have taken the initiative in developing more performance-based tests. These and other reforming districts can be contacted for their tests and the project might be able to assemble a testing instrument appropriate to its goals. However, one must remember that performance-based tests have not developed to the point where they can be used indiscriminately. They still have reliability issues associated with them and are not useful as an accountability tool in districts that do not routinely use them. Nevertheless, they can provide rich data to a project to diagnose problems and improve project activities.

TIMING OF EXPECTED OUTCOMES

Because of the confluence of the above factors--complex environments, newly developing interventions, etc.--changes in final outcome and performance indicators will probably not be apparent for several years. This is one reason why observable interim indicators become important. They can indicate whether the program is being implemented as planned and whether intermediate steps toward eventual outcomes are occurring.

While non-technology-based curriculum changes take considerable time, technology-based changes take even longer because of the additional time needed to acquire computers and become proficient in their use. An example indicates why. Projects begin by building organizational capacity and purchasing equipment. The equipment must be planned for, purchased, and installed. Teachers must be trained on the simple uses of the technology. For projects that require a new curriculum, the units must be developed and the units must be used by teachers long enough to gain proficiency. Students must be trained on the new equipment and exposed to the new units for some reasonable period of time before effects can occur. The bottom line is that implementation will take several years and final outcomes might not be apparent for longer periods. Test scores or other student performances will likely be the last outcomes to change.

This issue of the timing of project outcomes is especially serious for the Challenge Grant projects as they must be considered developmental--with full implementation, much less outcomes, not likely for several years. Therefore, final outcomes will not be evident for some time.

It is the job of the project managers and evaluators to create reasonable expectations for when changes are likely to occur and in what order. Constituencies can demand early results, especially in light of the sometimes large amounts of money spent to acquire technology. The publication or communication of interim outcomes and benchmarks is therefore an important way to provide these constituencies with needed information and should be a major concern of the project manager.

INFERENCE IN LONGITUDINAL STUDIES

The target group is the group of students or other participants who are expected to display measurable changes in behavior. In the case of the Challenge Grants this usually, but not always, refers to students and increases in their academic achievement. Ideally, the target group is stable over time, allowing for the steady measurement of accumulated change over time. The longitudinal nature of projects ensures that students will drop out of the projects and new learners will be added. Without controlling the target group, the ability to measure effects will be attenuated.

The Challenge Grant projects must plan for this eventuality. Some thought must be given to expectations for showing effects when the target group is mobile. Alternatives include: stabilizing the target population to ensure measurable results (one that is not feasible for the most part); the monitoring and documenting of changes in the target group to allow for the proper interpretation of outcomes; or tracking only those members who remain constant over time to measure the full effect of the program.

Another aspect of this is that all students and teachers, with or without the addition of the project effects, will become more adept at computer usage over the time period being studied. Separating the effects of the project from the more general effects of increased technology usage will be difficult. Alternatives to consider to enable measuring project outcomes versus general improvement include: tracking comparison groups not exposed to the project; or using national surveys or other studies to assess the likely level of this "background" effect and to remove it from the total effect measured.

MUTUALLY SUPPORTIVE PROJECT AND PROGRAM EVALUATION

The U.S. Congress and ED would like information about the program as a whole upon which to base their funding decisions and project accountability. Their intent is that the project evaluations add up to an appropriate program evaluation.

The most obvious approach is for ED to mandate a set of common indicators that would support a program evaluation. However, the unique

goals and outcomes sought by the projects, embedded in their evaluations, will not be measured by a single set of indicators, nor should they be. A single set of indicators across projects would change the incentives for project performance and reduce the diversity of approaches that the RFP intentionally encouraged. The Department of Education must balance the need for adequate information upon which to judge program success against the need for project-relevant evaluations.

Until the Department decides on an approach, the project managers must remain flexible. When an approach is determined, they and their evaluators will have to revisit their plans for data collection and reporting.

CONCLUSIONS

The issues described above have been faced by others and obstacles have been overcome. We urge the reader to use Appendix B and the references to gain insights into how to deal with these issues. In addition, the national educational labs associated with the projects are good sources of information to help guide the project managers and evaluators in making decisions.

In the next section, we discuss how projects can track and document their progress for both internal and external audiences.

4. TRACKING AND DOCUMENTING PROGRESS USING PORTFOLIOS

This section describes a means for tracking and documenting project progress and evaluative data--a project portfolio. It lays out some of the benefits of this approach, describes the components of the portfolio, and then describes the development of the different components in conjunction with the planning and improvement process described in Section 2.

In addition, Appendix A provides formats or templates for creating a portfolio. Appendix E includes an example portfolio for a technology-based project called Co-NECT.

PORTFOLIOS AS THE MEANS TO TRACK AND DOCUMENT PROGRESS

In any given month the project manager might be faced with requests for information about the project's progress. These might be:

- The Program Office requests information about the status of the project to be included in a report to the U.S. Congress.
- The consortium schedules an annual project review to determine future funding.
- A potential new investor asks for a briefing on the project goals, activities, or accomplishments.
- A project review is scheduled with the staff and the project manager must provide the information needed to staff to review project progress and revise the approach if necessary.

These information needs are real. A major challenge to project managers is to develop descriptions of projects and their progress that do them justice and that can be used to answer all of the above inquiries adequately. Our review of the Challenge Grant proposals revealed that they had ambitious goals and complex means for achieving them. Several projects are nested within broader systemic reforms at the state and district level. Some of these face shifting contextual factors, such as student demographic changes. The interventions

proposed include professional development, curriculum and software development, infrastructure changes and development--all in the same proposal.

We argue here that a potentially effective means for describing the project goals and progress of these complex projects is through the use of portfolios. A portfolio displays and documents the work and accomplishments of the project. It can include written descriptions, images such as pictures and videos, data summaries, work samples from students, and media coverage of the project. In other words, the portfolio can use a rich variety of data to portray the progress of the project.

We emphasize that the portfolio model is relatively new and still evolving. It is a tool under development. There is no fixed format and there are no proven results. However, users we have talked with claim results that we think might be useful to Challenge Grants.

First, the multimedia portfolio approach allows managers to portray projects and their accomplishments and shortfalls in complex ways that match the goals of the projects.

Second, the portfolio can be fitted to the planning and improvement process we advocated in Section 2. The model of a portfolio we propose provides answers to four categories of questions, each related to a different component of the planning and improvement process.

The process of portfolio development and the process of planning and improvement are in a sense synonymous. Both mutually support project managers in laying out and executing plans for assessing progress, in developing information on progress useful for internal decisions, in reviewing project performance, and in communicating with their different audiences the changes taking place as a result of the interventions.

Third, because development of the portfolio is matched to the discipline of the planning and improvement process, it is updated on a timely and regular basis. It does not require elaborate publication processes or reviews. It portrays the project progress in a timely and immediate fashion.

Fourth, also because it is integrated into the planning and improvement process, the tracking of progress and outcomes displayed in the portfolio can be used for both internal and external decision making. It can be used by multiple audiences for multiple purposes.

COMPONENTS OF A PORTFOLIO

Because portfolios can best be categorized as a tool under development, there are no written rules for how to go about developing them. To complement the planning process described above, however, we suggest that a portfolio template have five sections. The first four correspond to the planning and improvement process laid out above as well as the information categories described.

Project Goals and Activities. The first component describes the project's goals and activities and answers the following questions: What are the project goals, including specific target populations and geographic area? How does the project intend to accomplish its goals? What are the project activities, indicators of progress and benchmarks?

Project Context. The second component describes student, school, and community characteristics; it corresponds to the collection of contextual information necessary to set realistic goals and to understand intervening effects of programs and actions external to the project. It answers the question: what is the context for the project, including the identified needs of the community?

Project Progress. The third component portrays implementation levels and interim and later outcomes for major program elements. It answers the questions: What progress is sought? What progress has been made? How is that known? This corresponds to the routine collection of information on progress in terms of implementation processes, quality, and performance.

Project Improvement, Learning, Challenges, and Recommendations. This component answers the following questions. What are the plans for improvements and growth? What lessons have been learned to date? What challenges remain? The recommended adjustments in project planning or implementation appear here and correspond to the activities undertaken as a result of the evaluative information.

Supporting Appendices. The final component includes data displays to support information given in the body of the document.

The next several sections describe how to develop the information included in each of these components by referring back to the planning and improvement model. In this way we hope to make clear that the development of the portfolio is synonymous with a planning and improvement process, but that the process of development is as important, if not more so, than the actual set of products produced for the portfolio.

COMPONENT 1: PROJECT GOALS AND ACTIVITIES

The first section of the portfolio describes the project's goals and activities. It comes out of an exercise to properly identify goals, gain support for those goals from stakeholders, and identify needed activities to meet those goals.

Specification of goals and objectives is step one in the process of establishing shared expectations for the project. Goals and objectives are developed in response to performance gaps identified through gap analysis or needs assessments. This process draws on the talents and views of school staff, parents, and other project stakeholders. Progress assessments begin with a mapping of the primary and secondary goals of the project. Challenge Grant managers would specify goals and objectives in major areas and state their comprehensive aims for student improvement.

Goal statements should reflect major project efforts. For example, Co-NECT designers describe their global goal for technology use in this way:¹

The Co-NECT design provides a vision of a technological infrastructure featuring unimpeded access to video, computer and software tools for all members of the learning community, and a flexible communication network linking all computers in the school with each other, and with computers around the world.

¹Co-NECT is one of the NAS designs. One of its purposes is to increase significantly the use of education technology in schools using its design.

Given that goal, the project managers at a Co-NECT school might set the following objectives for professional abilities and, therefore, professional development:

- Teachers will be able to develop and deliver video and broadcast productions of their work and school events and transmit this knowledge to students.
- Teachers will be able to learn about and make frequent use of computer technology, as well as word processing, spreadsheets, data bases, Internet browsers and other communication tools and transmit this knowledge to students.
- The school will establish an Internet connection and local area network and teachers will utilize the capacity for communication, data access, and professional collaboration and enable students to do likewise.
- Teachers will access technology coordinators provided by the school to promote and support wide availability and widespread use of video equipment, computers, and software tools and enable students to do the same.

These teacher professional development objectives make concrete the vision for improvement. Managers draft corresponding statements of the project objectives for major project elements or components and incorporate them into the portfolio.

The next step is to trace the objectives to the activities of the project and lay these activities out in an organized fashion so that readers can understand the connection between the goals and the activities.

As stated in Section 2 of this sourcebook, indicators and benchmarks for progress should also be developed early-on for tracking progress over time. For each indicator of interest, benchmarks (hoped-for accomplishments or milestones) should be specified for key points in the project's life; that is, Challenge managers should record what they will strive for and reasonably can expect by way of implementation progress. For example, benchmarks for the numbers of expected

curriculum units developed, teachers asserting they fully understand the project, teachers using technology tools on a daily basis, and students scoring at proficient levels on performance assessments could be laid out.

Project stakeholders with different interests and prior beliefs should be called upon to help map benchmarks; alternately, they can be asked to review benchmarks before final adoption. The conversations that are key to forecasting accomplishments help promote shared expectations for progress. Making aims concrete for different project areas and time-frames gives stakeholders a chance to weigh in on the implementation and evaluation plans. It provides participants with an opportunity to share their views and hear the perspectives of others. Specification of benchmarks over time provides foreknowledge of the pace at which improvement is expected.

The benchmarks would serve as progress standards. Participants might indicate what they hope to see at the end of each of the first and second years; they also might note sought-after progress and outcomes by the end of year four.

COMPONENT 2: PROJECT CONTEXT

The second section of the portfolio provides a description of the school and its community. Projects do not take place in a vacuum--they unfold in communities and schools that have their own histories, strengths, and weaknesses. Information about demographic and academic backgrounds of student groups is critical to understanding the need for change, what changes have actually taken place, and which factors are responsible for those changes. Project managers and stakeholders need contextual information to understand a project's challenges and true effects.

Project leaders, evaluators, and site representatives (schools, community organizations, etc.) should discuss the environment and its implications for the project's likely effects. For example, the demographic background of students will influence outcomes. Students from high socioeconomic backgrounds on average have better educational outcomes than students from lower socioeconomic backgrounds. In

evaluating the effects of the project on educational outcomes, the evaluator would like to control for socioeconomic factors to ensure that the project, and not changes in demographic factors, was associated with changed outcomes and to understand whether the program had different effects on students with different backgrounds, especially targeted populations.

Information on any competing or complementary programs in the district is also important. A project might be part of a complex reform that changed student standards and assessments at the same time it increased technology use. Alternatively, it might be a stand-alone project with limited intentions and impacts. Evaluations of these two types of projects will be different, as will expectations for measurable results.

A final example could include changes in the project's environment after it begins that might seriously affect the project. For example, funding might decrease. Local demographics might shift calling for changes in interventions. Significant increases in the student populations with English as a second language might occur. In one case of school-based reform we studied, the school's location in south central Los Angeles had important implications for the impact of the reform. During the three years of the study, the school and its community went through fires, a major earthquake, social unrest, and a teachers' strike. Progress on school reform was seriously slowed by these travails. Documenting these circumstances could help both internal and external audiences understand the challenges the project faced in meeting its goals.

COMPONENT 3: PROJECT PROGRESS

Tracking project progress is important for at least two reasons. First, this information alerts managers to delays and difficulties in implementation activities. Projects do not produce outcomes if they are not implemented, and education reform has a long history of poor implementation. Second, it is necessary to explore for decision making the hypotheses and claims about the relations between project activity and observed outcomes. Tracking the desired outcomes will show if in

fact they are changing in the right direction. If they are not, remedies can be sought. These might include, if necessary, restructuring the project.

The third component, therefore, portrays implementation levels, the quality of the implementation, and changes in interim and final performance indicators for major program elements. Progress would be tracked and recorded here on the indicators and benchmarks developed in the first component. Narrative and graphic progress summaries would appear for each major project area (curriculum and instruction, standards and assessment, school organization, teacher professional development, etc.). Additionally, available comprehensive student and project data would be reported, including attendance, promotion, graduation, drop-out, college placement, parent and community involvement rates, and so on.

For each major project area (and for the comprehensive project data), the information can be organized as an information pyramid. The top level of the information pyramid gives a short, directed portrayal of the most interesting information about implementation and outcomes. Results might be presented in bulleted format to make the reader's review of findings and progress easier. The second level gives a more extended, descriptive and qualified discussion of the data and their context. Easy-to-read tables and graphs might appear in the second level. The third level includes case study reports, narrative data, or sample materials to illustrate and make richer the information provided in the top level.

Progress on Implementation Processes

The first category of indicators includes data about things we call implementation processes. They are important to determine early on whether project components are, in fact, being implemented. Implementation evidence is needed to gauge progress, frame project adjustments, and understand outcomes--or their absence. These observables, framed as indicators and benchmarks, are the manifestations of the implementation of an intervention. They are things observers can see in a school building, home, community center, etc., that suggest the

project is under way. For example, evidence of implementation of projects might be indicated by the existence of:

- Mission statements, operational plans, and evaluation plans.
- New resource allocations and technology investment funds.
- Training plans and sessions on new technology.
- Curriculum quality review teams or curriculum development teams.
- New standards or assessment workshops.
- Technology planning teams and their development of technology plans.
- Community meetings about how to foster technology use.

Implementation progress likewise might be suggested by indications that the consortia has developed plans for or actually put in place important relevant components of the intervention, such as:

- Computer and technology centers.
- New personal computers and software.
- Parent and community volunteer programs.
- Student performance standards.
- Curriculum units and lesson plans effectively incorporating technology.
- Interdisciplinary or project-based instructional materials effectively incorporating technology.
- Project-related technology and supports.

Implementation observables for different areas of educational change are given in Appendix D as examples of what might be considered. These may help stimulate users' thinking about meaningful indicators of project initiation and implementation.

Quality Indicators and Participants' Judgments

In many cases, statements about implementation observables can and should go beyond assertions of presence or absence; the data can show

the levels at which indicators are present or the quality of the products. For example, helpful information about the depth of implementation would be obtained by counting accomplishments: the number of completed curriculum units, number of faculty completing professional development on new technology or using the Internet, number of parents using computer technology, or number of businesses and non-profits participating in the consortia.

For those projects involving teacher professional development, for instance, the following quantitative observables about implementation would be informative:

- Amount of time devoted to professional development during the year (with indicators of spacing over the year).
- Amount of time set aside for teacher collaboration on technology-based curriculum during the year (with indicators of spacing over the year).
- Number of days of professional development devoted specifically to technology during the summer or throughout the year.
- Number of teachers participating (and electing not to) in technology professional development.

As the project proceeds, it would be important to learn whether these are associated with positive changes for teachers and positive changes in performance indicators.

Establishing the level of quality of the products being developed in the implementation processes often requires the use of participant judgments or other judgments based on a set of rubrics or standards. For example, it would be useful to document not just how many units of study had been produced, but also the level of quality of those units based on a set standard and supported by a rubric for assessing quality. Alternatively, many projects hope to change teacher practices. This might be assessed using observations of classroom practices based on a rubric of best practice.

Participants can provide invaluable information about perceived quality and benefits. The judgments of students, teachers,

administrators, parents, and project staffs are important inputs for monitoring progress. Traditional project evaluation paradigms rate the information value of perception data lower than more directly observed data on implementation and outcomes; however, in education reform in uncertain and complex settings, their utility to the project manager for improving the project can be high. The buy-in and sustained support of participants are likely to be related to the quality of participants' efforts. Participants' judgments can suggest needed project refinements; they additionally provide early estimates of project effects.

For various Challenge project elements, for example, participants might be asked to address.

- The quality, comprehensiveness, and appeal of the curriculum.
- Their satisfaction with associated instructional strategies.
- Perceived levels of student engagement in the project.
- The degree to which students seem to be learning better because of the project.
- The degree to which teachers seem to be teaching better because of the project.
- The teachers' satisfaction with their changed roles.
- The quality of products issued by management or topical committees (e.g., curriculum, technology, etc.).
- The perceived usefulness of technology to students, teachers, and project managers.

These data would provide valuable direction for project efforts. For several areas (e.g., student engagement and achievement levels), more direct assessment is also possible and should be pursued. Using teacher professional development to illustrate, teachers might be asked for their perspectives on:

- Their level of understanding of project intentions.
- The quality of professional development materials and experiences.

- The usefulness of new practices and subject matter presented at workshops.
- Their facility with strategies, protocols and equipment presented by the workshops.
- The benefits of teamwork and ongoing teacher collaboration.
- Suggestions for neglected professional development topics and areas for future improvement.

Administrators' judgments on these matters also would be informative. Data on Challenge Grant participants' perceptions could be collected in numerous ways (surveys, progress rubrics, interviews, focus groups).

Interim and Final Performance Indicators

Like economic indicators, performance indicators describe the health, quality, or effectiveness of the system. They have meaning when they are compared to something; performance indicators can be compared to themselves over time and/or to agreed-upon standards for success. They correspond more closely to conventional notions of accountability than the types of evidence of progress described to this point. In the short term, managers might look for the impact of their work, for example, in increased student engagement, parental involvement, and teacher retention (in the project). They might realize growing community support or business participation. In the longer-term, they might look for increased numbers of students meeting high standards on state performance assessments and for fewer students in the lowest score categories. Managers might look for declines in disciplinary referrals and special education placements.

Examples of performance indicators for different project elements include those addressing:

- Levels of student engagement in project activities.
- The degree to which students are learning better in the project (as measured by performance-based assessments).

- The degree to which teachers are teaching better in response to the project (as measured by technology-based "good practices" indicators).
- Involvement of project constituents in public engagement efforts.
- Results of ongoing attempts to keep and build support.

Unquestionably, some project outcomes are more easily and directly measured than others. Direct measures of student engagement, for example, can be made by trained observers recording student time on-task and off-task over a number of occasions. This type of data collection is time- and labor-intensive. Alternatively, an indirect measure of engagement might be afforded by student attendance levels, homework completion rates, or rates of participation in project activities. These indicators would serve as proxies for more direct indicators of student engagement. Though they are not ideal, indicators of engagement provide reasonable information given the time, cost, and expertise needed to index them.

As for student performance measures, they must be aligned with project goals if they are to clearly indicate project progress. Student achievement data should come from assessments of student competencies sought by the intervention. In the context of some Challenge Grants, students' accomplishments might be best described by performance assessments, portfolios, learning records, and exhibitions. These have in common the goals of assessing and displaying the critical thinking skills of students and their ability to apply knowledge in meaningful ways, rather than assessing their ability to repeat content. Several states have developmental or operational performance assessment programs in place. These are designed to measure student performance on complex problems using important skills the states seek to promote.

When appropriate, part of the progress data should be compiled on norm- or criterion-referenced tests. Appropriateness in this context means that the norm- or criterion-referenced test measures the outcomes sought by the project or an important set of outcomes that cannot be ignored in assessing student performance (i.e., that declines in test

scores would not be a desired outcome even if they do not exactly match the new performances sought). When appropriate, project managers should try to check stakeholders' attempts to depict standardized test data as the sole hallmarks of project success or failure. Other assessment instruments, if better aligned with project efforts, should be used. Reporting multiple and varied progress indicators is a preferable option to reporting a single indicator, especially if it does not match project goals well.

Managers might also be interested in progress on school performance indicators. For example, most school districts strive to improve student attendance levels; reduce dropout rates; effect successful transitions to work, the military, and post-secondary education; and increase teacher attendance. Objectives for the school should be specified in the same way that statements are laid out for individual project areas. Relevant data should be tracked at the outset and as the project matures.

COMPONENT 4: PROJECT IMPROVEMENT, LEARNING, CHALLENGES, AND RECOMMENDATIONS

The fourth component discusses the implications of progress to date, recommendations for changes to the project, or changes made to the project as a result of review of the information collected and analyzed in the previous components, and remaining challenges. This part of the portfolio reflects the thinking and judgments of the project leaders, consortium members, evaluators, or other participants. They should summarize the project's accomplishments and shortfalls and make recommendations for improvement.

This step is necessary for continued improvement. The documentation is necessary to clarify, upon regular review, the historical basis for decisions. Such information can be especially important if the project is subject to frequent turnovers or suffers a turnover of leadership.

External audiences also will find this information useful. For similar projects, it offers a running history of lessons learned. It allows developers and reformers to learn from the project's successes and struggles. For community members and oversight groups, it documents

the project's current direction and furnishes proof of whether project managers have been careful stewards of funds.

COMPONENT 5: SUPPORTING APPENDICES

The final component simply includes more detailed data displays to support more summary information given in the body of the portfolio. They indicate what belongs in the main part of the portfolio to provide concrete evidence and what belongs in appendices because it is too detailed for the main sections, but still of interest to some readers.

At each installment of the portfolio and as the project is informed by experience, more numerous and telling information about progress and project outcomes will be offered.

SUMMATIVE INFORMATION SHEETS

We have not discussed how the Program Office can use the portfolios for its own purposes. This will depend on the approach the Department takes to the program evaluation, which remains unclear at this point.

However, one simple aid to the Program Office might be a common worksheet or summary sheet used by all projects that prefaces each portfolio. We argue for a minimal number of common indicators. Table 4.1 is a proposed framework for such a set of indicators and descriptors. The table constitutes a possible starting point for developing common indicators and descriptions by the Program Office.

These indicators and descriptors fall into six broad categories (which are not wholly distinct):

1. The instrumental purposes of the project: how the project seeks to improve the learning of its target population.
2. The primary objects of expenditure of project funds.
3. A description of the population(s) served by the project.
4. Descriptions of the leadership and organization of the development and implementation work.
5. Enumeration of the desired performance outcomes.
6. Special features of the project.

Table 4.1
Project Descriptors and Indicators

1.	Purpose(s) of Project	
	a) Improving what is learned (Content)	<i>These descriptors focus on the means by which the project believes its activities will improve the learning of its target population. Each project might assign relative weights to the purposes, since many will see several as important. These could change over time.</i>
	b) Improving how it is learned (Pedagogy)	
	c) Increasing access	
	d) Improving the knowledge resources available to students and teachers (Enrichment)	
2.	Project Expenditures	
	a) Hardware	<i>Indicators should be developed that are common across projects (e.g., computers, types of connections, training hours, etc.). These should be supplemented by descriptions of curriculum or training. Use of funds might also be an indicator.</i>
	b) Connections and networking	
	c) Training and support	
	d) Content	
3.	Populations Served by Project	
	a) Geographic location (e.g., rural, urban)	
	b) Student population targeted (e.g., migrants, poor, ethnic minority)	<i>Number and composition may vary through time.</i>
	c) Class of "actor" served (e.g., student, teacher, parent, administrator)	<i>Relative emphasis may vary through time.</i>
	d) Component of school served (e.g., whole school, subject area, ...)	<i>Probably a onetime design feature.</i>
	e) Number of sites (e.g., single school, multiple schools, multiple districts)	<i>Probably will vary through time</i>
	f) Grade level served	

4. Project Leadership and Staff		This is probably a stable descriptor such as school district technology coordinator or director of non-profit consortia. Other descriptors might include advisory or governing board membership. A set of descriptors should be developed that will allow the nature of the development and implementation effort to be described. A set of descriptors should provide indications that the project is being managed in a planfull manner
a)	Leadership and supporting consortia	
b)	Project staff	
	1. teachers	
	2. administrative staff	
	3. volunteers	
	4. other employees	
c)	Progress toward organizational goals	
	1. comprehensive mission statement	
	2. strategic plan relating activities to objectives	
	3. operating plan with benchmarks	
	4. functioning consortium with active leadership	
	5. evaluation process linked to project objectives	
5. Desired Outcomes		As the indicator areas suggest, outcomes may be either intermediate or ultimate outcomes. The learning of students is clearly important. However, the fact that new groups of learners have been formed or that classrooms operate in significantly different ways may also be important. Individual projects should try to specify outcomes by which they would ultimately like to be measured. It may be possible to group projects by types of outcomes sought in order to aggregate results.
a)	New learning communities (e.g., newly networked learners, restructured roles in school, more meaningful engagement of parents)	
b)	New teaching behaviors: (e.g., more project based instruction, flexible grouping of students, etc.)	
c)	Improvements in equity (e.g., more use of technology by special populations or by districts with different assets, instruction tailored more effectively to student needs).	
d)	Student performance (traditional and new measures)	

Table 4.1 (Continued)
Project Descriptors and Indicators

6.	Special project features	
	a) component of large reform effort	<i>This is not intended to be a taxonomy of features but rather a place to note distinctive qualities of the projects.</i>
	b) sources of funding	
	c) focus on particular technology	
	d) important use of new class of resource (e.g., museum, library).	
	e) etc.	

SUMMARY

Our concept of a portfolio matches the process of planning and improvement described in Section 2. It is useful in the development, tracking, and display of the evaluative information developed by the project. Its potential, however, is not yet fully understood. We encourage the projects to consider this approach or search for their own way to convey immediate information about their projects to both internal and external decision makers and audiences in ways that make the projects and their accomplishment come to life.

5. NEXT STEPS FOR MANAGERS AND EVALUATORS

In terms of this sourcebook the obvious next step is for managers to peruse the appendices for information helpful to them and use it in the course of discussions described in Section 2 to develop sound evaluation plans. For this purpose Appendix A provides an example template for portraying the results of a progress assessment. The template shows the components of a progress portfolio and gives worksheets for specifying goals, benchmarks, and data collection activities.

Appendix B is an annotated bibliography on educational evaluation and, in particular, on the evaluation of technology-based programs. Some of the entries correspond to resources about general issues in evaluation. Others describe evaluation challenges and techniques. References to electronic documents also are given.

Appendix C lists the contacts for the projects.

Appendix D is a collection of evaluation planning and data collection instrumentation. These come from a number of sources, and again, are meant to be illustrative. Several come from Challenge Grant applications, others from the literature, and a number from projects supported by the New American Schools, sponsor of the Co-NECT program. The surveys, interview guides, observation checklists, and other data collection and planning tools/products are included as examples of relevant formats and content. None can be adopted wholesale. They serve as examples. Some might be adapted and revised to reflect project goals and lines of inquiry.

Appendix E provides an example project portfolio. The progress portfolio was developed by project designers and evaluators for the Co-NECT school design. The Co-NECT project was undertaken by a group within the Educational Technologies Department of Bolt, Beranek and Newman, Inc. Not dissimilar in conception to some of the Challenge projects, the Co-NECT design has five elements: school-based design, performance assessment, project-based learning, professional community, and use of technology. At the time of the excerpted report, the design

had been implemented in three sites. The Co-NECT progress portfolio describes their work, accomplishments, and challenges. It serves to illustrate the portfolio template.

REFERENCES

Herman, Joan L., Winters, L. (1992), *Tracking Your School's Success*
Newbury Park, CA: Sage.

Herman, Joan L., "Evaluating the Effects of Technology in School
Reform," Barbara Means, Ed. (1995), *Technology and Education Reform:
The Reality Behind the Promise* (133-167). San Francisco: Jossey-Bass.

Barbara Means, Ed. (1995), *Technology and Education Reform: The
Reality Behind the Promise* (133-167). San Francisco: Jossey-Bass,
pp. 133-166.

Appendix A

CREATING A PROGRESS PORTFOLIO: FORMATS AND TEMPLATES

This appendix provides a sample template for developing a *Progress Portfolio* (see Figure A.1). The portfolio is meant to provide a longitudinal record of project progress in relation to intents and design features. As described earlier, the assessment is designed to elicit varied and rich data about initial implementation levels, early outcomes, and--over time--later indicators of challenge grant progress and project effects. For example, the progress portfolio records things assessed, refined, and learned. It highlights successful project elements and points out remaining challenges. It offers suggestions for upcoming work and fosters project improvement.

In addition, the portfolio seeks to provide important and necessary accountability information for numerous stakeholder audiences, including state and local officials, parents, community members, founders, and fellow reformers. It can be used to establish the agenda for ongoing improvement, and it promotes fuller and continuing understanding of progress for present and future innovators.

The portfolio template has five sections:

- A statement of the project's vision and objectives.
- A description of the student population, school and community.
- Descriptions of initial implementation levels, early outcomes, and--over time--later indicators of progress and project.
- A summary of progress and challenges, with recommendations for future reform work.
- Appendices providing data displays to support the body of the portfolio.

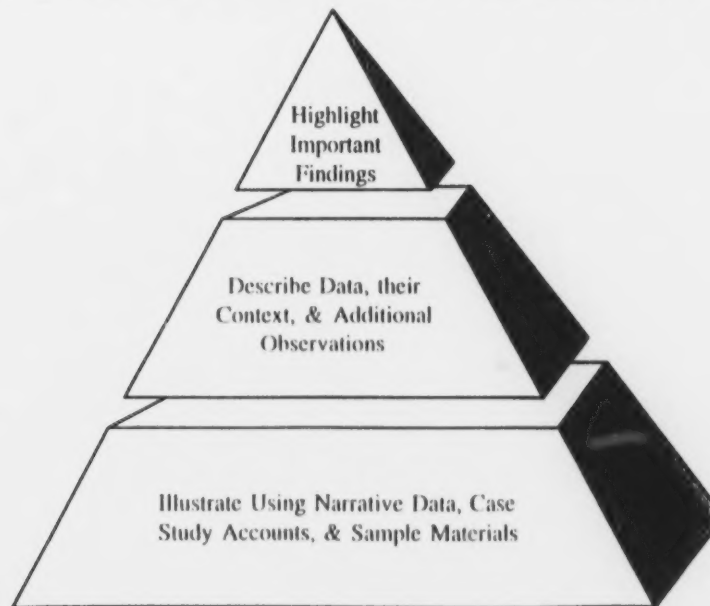
FIGURE A.1

PORTRAYING PROGRESS: CREATING A CHALLENGE PROJECT PORTFOLIO

Describe Project Vision & Objectives

Depict Students, Schools & Community

Describe Implementation Levels & Outcomes



Summarize Progress & Challenges, Outline Recommendations for Future Work

OBJECTIVES STATEMENT WORKSHEET

- **Standards and Assessment**

Objective 1:

Objective 2:

Objective 3:

- **Curriculum and Instruction**

Objective 4:

Objective 5:

Objective 6:

- **Teacher Professional Development**

Objective 7:

Objective 8:

Objective 9:

- **Technology Use**

Objective 10:

Objective 11:

Objective 12:

- **School Organization and Governance**

Objective 13:

Objective 14:

Objective 15:

- **Family and Community Services**

Objective 16:

Objective 17:

Objective 18:

- **Public Engagement**

Objective 19:

Objective 20:

Objective 21:

- **School/System/Project Partnering**

Objective 22:

Objective 23:

Objective 24:

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- **Comprehensive Student Performance and School Improvement Goals**

Objective 25:

Objective 26:

Objective 27:

PROGRESS INDICATOR/BENCHMARK WORKSHEET

OBJECTIVES	INDICATORS	SPRING 1997 BENCHMARKS	SPRING 1998 BENCHMARKS	SPRING 2000 BENCHMARKS
• Standards and Assessment				
Objective 1:				
Objective 2:				
Objective 3:				
• Curriculum and Instruction				
Objective 4:				
Objective 5:				
Objective 6:				
• Teacher Professional Development				
Objective 7:				
Objective 8:				
Objective 9:				
• Technology Use				
Objective 10:				
Objective 11:				
Objective 12:				

• School Organization and Governance				
Objective 13:				
Objective 14:				
Objective 15:				
• Family and Community Services				
Objective 16:				
Objective 17:				
Objective 18:				
• Public Engagement				
Objective 19:				
Objective 20:				
Objective 21:				
• School/System/Project Partnering				
Objective 22:				
Objective 23:				
Objective 24:				

• Comprehensive Student Performance and School Improvement Goals				
Objective 25:				
Objective 26:				
Objective 27:				

DATA COLLECTION WORKSHEET

GOALS	INDICATORS	DATA COLLECTION METHOD	DATA SOURCE	DATA COLLECTION WINDOW
• Standards and Assessment				
Objective 1:				
Objective 2:				
Objective 3:				
• Curriculum and Instruction				
Objective 4:				
Objective 5:				
Objective 6:				
• Teacher Professional Development				
Objective 7:				
Objective 8:				
Objective 9:				
• Technology Use				
Objective 10:				
Objective 11:				
Objective 12:				

• School Organization and Governance				
Objective 13:				
Objective 14:				
Objective 15:				
• Family and Community Services				
Objective 16:				
Objective 17:				
Objective 18:				
• Public Engagement				
Objective 19:				
Objective 20:				
Objective 21:				
• School/System/Project Partnering				
Objective 22:				
Objective 23:				
Objective 24:				
• Comprehensive Student Performance and School Improvement Goals				

Objective 25:				
Objective 26:				
Objective 27:				

Appendix B

ANNOTATED BIBLIOGRAPHY ON EDUCATIONAL EVALUATION

This annotated bibliography is organized according to themes found in the literature.

I. Evaluation: A General Overview

Patton, Michael Q. (1986). *Utilization-Focused Evaluation* (2nd Edition). Newbury Park, CA: Sage.

In a book that combines both the theoretical and the practical, Patton examines how and why to conduct evaluations. In this revised and updated edition, the author provides practical advice grounded in evaluation theory and practice, and shows how to conduct evaluations from beginning to end in ways that will be useful--and used. This volume discusses the ferment and changes in evaluation during the eighties and the tremendous growth of "in-house" evaluations conducted by internal evaluators. Patton also discusses a methodological synthesis of the "qualitative versus the quantitative" methods debate, as well as the cross-cultural development of evaluation as an internationally recognized profession. *

Stevens, F., Lawrenz, F., Sharp, L. (1993). *User-Friendly Handbook for Project Evaluation: Science, Mathematics, Engineering and Technology Education*. Alexandria: National Science Foundation.

A basic overview of the process of evaluation. Questions addressed include: how do you develop evaluation questions, how to determine what data collection techniques to use, how do you communicate results.

II. Issues in evaluating technology

A. Positive Examples

Cognition and Technology Group at Vanderbilt (1992). *The Jasper Experiment: An Exploration of Issues in Learning and Instructional Design*. Educational Technology Research and Development, v.40, 65-80.

This report discusses the progressive and highly regarded "The Adventures of Jasper Woodbury" series. Students are shown videotapes of a story line which includes all the relevant information needed to solve a set of problems. The series emphasizes complex, open ended problem solving. Programs are based on cognitive theory (which stresses the importance of active knowledge) and are structured to support constructivist learning. They are also designed to foster cooperative learning. Part of the program's success is due to the fact its researchers and developers were very involved in the program's implementation.

Means, B., Olson, K. (1994). The Link Between Technology and Authentic Learning. *Educational Leadership*, v.7, 15-18.

This article uses a technology program at the Frank Paul Elementary School to outline the criteria for successful projects: an authentic, challenging task, a project where all students practice advanced skills, where work takes place in heterogeneous, collaborative groups, the teacher acts as coach and provides guidance, and where work occurs over extended blocks of time.

Means, B., Olson, K., Singh, R. (1995). Beyond the Classroom: Restructuring Schools with Technology. *Phi Delta Kappan*, September 1995, 69-72.

The authors observe that successful technology programs require a "coherent, school-wide instructional vision--a consensus around instructional goals and a shared philosophy." The article also offers recommendations about ways to make teachers comfortable with technology, and discusses creative ways for schools to make the most of limited computer resources.

Niemic, R.P., Walberg, H. (1985). Computers and Achievement in the Elementary Schools. *Journal of Educational Computing Research*, v1(4), 435-440.

This summary of a comprehensive meta-analysis of computer assisted instruction (CIA) research provides statistical data to illustrate the success of this method. Conclusions are drawn about CIA's effectiveness in different student populations.

Riel, M. (1989). The Impact of Computers in Classrooms. *Journal of Research on Computing in Education*, Winter 1989, 180-190.

This report to the National Education Computing Conference charts a study that introduced computers into four elementary school classrooms. The author discusses the project from start to finish, giving a good sense for how this type of research is facilitated and evaluated. She concludes that this study was extremely successful largely due to the emphasis placed on contextualized learning, i.e., kids can use what they learn at school in the "real world."

B. Difficulties in Evaluating and Implementing Technology Programs

Dwyer, David (1991). Changes in Teachers' Beliefs and Practices in Technology-Rich Classrooms. *Educational Leadership*, v48(8), 45-52.

In an analysis of the Apple Classroom of Tomorrow program, Dwyer highlights the difficulties teachers have adopting the technology to the way they currently teach and then making the transition to actually inventing new instructional methods that incorporate the resources they've been given. The author also charts the different phases of the

project and discusses the different expectations teachers had through the course of these phases. A table lays out these expectations graphically.

Herman, Joan (1994). Evaluating the Effects of Technology in School Reform. In Barbara Means (Ed.), Technology and Education Reform: The Reality Behind the Promise (133-167). San Francisco: Jossey-Bass.

A look at the difficulties of evaluating technology-based innovations in education: imperfect research environments, implementation problems due to time constraints and lack of adequate exposure to the technology, and imperfect longitudinal study environments due to student attrition or lack of funding. The article includes a mock project that is then analyzed for problems.

Stevens, F., Lawrenz, F., Sharp, L. (1993). User-Friendly Handbook for Project Evaluation: Science, Mathematics, Engineering and Technology Education (Chapter 5). Alexandria: National Science Foundation.

A fictional example of a troubled study. The evaluation recorded here lacked progress evaluations, relied only on a single measurement, and misinterpreted data because they did not disaggregate results. Good example of problems to avoid.

C. Ideas for Improved Evaluations

Gearhart, M., Herman, J.L., Baker, E.L., & Whittaker, A.K. (1992). Writing portfolios at the elementary level: A Study of new methods for writing assessment (Tech Rep 337). Los Angeles: University of California, Center for the Study of Evaluation.

A study about evaluating writing ability through the Writing Portfolio method as opposed to the standard timed test of old. The portfolio method includes both completed work and rough drafts. In her overview Herman applauds this method because it allows the evaluators to see the word processing capabilities students have developed. This report includes a rating scale for how to rate writing.

House, Ernest R. (1993). Professional Evaluation- Social Impact and Political Consequences. Newbury Park, CA: Sage

The author is a professor in the School of Education at the University of Colorado and an experienced evaluator of major social and educational programs. In the author's own words, this book: "is about analyzing the social, political, economic, historical, and cultural influences on evaluation." It provides a thoughtful overview of the field's evolution, from its earlier reliance on "value-free" experimental and primarily quantitative methods to the current emphasis on methods more appropriate to the diverse, multicultural, and politically charged environment in which social and educational programs operate.*

Linn, R., Baker, E., Dunbar, S. (1991). Complex, performance-based assessment: Expectations and validation criteria. *Educational Researcher*, 20(8), 15-21.

The authors argue that a direct assessment of performance skills is the key to valid assessment results. A set of criteria that are sensitive to some of the expectations for performance based assessments is proposed. Technology provides the instrument to measure direct performance.

Lomask, Michael S., Jacobson, L., Hafner, L. (1995). The Development and Validation of an Assessment of Safety Awareness of Science Teachers Using Interactive Videodisc Technology. *Science Education*, 79(5), 519-534.

The Safety Simulator provides yet another unique alternative to the troubled direct observation method. Interactive videodisc technology was used to assess science teachers' knowledge about lab safety. The Simulator evaluations proved to be easy to administer, efficient, cost effective and have good standardization. The article discusses problems with direct observation.

Poirot, James L. (1992). Assessment and Evaluation of Technology in Education: Teacher as Researcher. *Computing Teacher*, v20(1), 9-10.

The author gives his views about the state of assessment and evaluation and offers some suggestions for improvement. He emphasizes the importance of adequate planning, of examining student gains, and of analyzing teachers' needs and attitudes.

III. Examples of instrumentation for observing different types of variables

Baker, Eva L., Herman, Joan L. (1988). *Implementing STAR: Sensible Technology Assessment Research* (Rep. 285). Los Angeles: University of California, Center for the Study of Evaluation.

This report for evaluating the Apple Classroom of Tomorrow presents the STAR model for implementation. The authors provide a Phase I discussion of how the evaluation team will go about getting started. The model is guided by these questions: what effects will ACOT have on students, on teachers, and what are other possible effects? A set of measures for various activities (such as student writing and problem solving) is provided.

Fowler, Floyd J., Jr. (1993). *Survey Research Methods* (2nd Edition). Newbury Park, CA: Sage.

Using non-technical language, the author has provided a comprehensive discussion of survey design (including sampling, data collection methods, and the design of survey questions) and procedures which

constitute good survey practice, including attention to data quality and ethical issues. According to the author, "this book is intended to provide perspective and understanding to those who would be designers or users of survey research, at the same time as it provides a sound first step for those who actually may go about collecting data." *

Gearhart, M., Herman, J.L., Baker, E.L., & Novak, J. (1992). *A new mirror for the classroom: A technology-based tool for documenting the impact of technology on instruction* (Tech. Rep. No.336). Los Angeles: University of California, Center for the Study of Evaluation.

This report was presented to the Apple Classroom of Tomorrow. It describes an observation instrument for documenting the impact of technology on classroom instruction and provides criteria for the coding of certain activities. The authors also provide examples of indicators: do teachers' roles shift when technology is in use, does technology have an impact on students' responses to instruction, etc. Gives examples of their expectations and their results.

Herman, Joan L., Winters, L. (1992). *Tracking Your School's Success* (Chapter 5). Newbury Park, CA: Sage.

This general guide to evaluation includes a useful chapter on analyzing information. It provides help with organizing data and answering needs assessment questions. The chapter also provides a guide to assist with answering formative evaluation questions.

IV. Examples of measurement issues

Campbell, Donald T. & Stanley, Julian C. (1966). *Experimental and Quasi-experimental Designs for Research*. Boston, MA: Houghton Mifflin.

This slim volume is a slightly enlarged version of the chapter originally published in the 1963 Handbook of Research on Teaching and is considered the classic text on valid experimental and quasi-experimental designs in real world situations where the experimenter has very limited control over the environment. To this day, it is the most useful basic reference book for evaluators who plan the use of such designs. *

Guba, E.G. & Lincoln, Y.S. (1989). *Fourth Generation Evaluation*. Newbury Park, CA: Sage.

The authors propose a monumental shift in evaluation practice, advocating the constructivist position in its most extreme form. Guba and Lincoln describe problems faced by previous generations of evaluators--politics, ethical dilemmas, imperfections and gaps, inclusive deductions--and lay the blame for failure and non utilization at the feet of the unquestioned reliance on the scientific/positivist paradigm of research. Fourth generation evaluation moves beyond science to include the myriad human, political, social, cultural, and contextual

elements that are involved in the evaluation process. This book describes the differences between the earlier (and still widely used) evaluation model, based on positivist/scientific assumptions and statistical techniques, and the naturalistic approach to evaluation, and outlines methodological guidelines for the conduct of naturalistic evaluations. *

Jaeger, R.M. (1990). *Statistics: A Spectator Sport* (2nd Edition). Newbury Park, CA: Sage.

This book takes the reader to the point of understanding advanced statistics without introducing complex formulas or equations. It covers most of the statistical concepts and techniques which evaluators commonly use in the design and analysis of evaluation studies, and most of most of the examples and illustrations are from the field of education. The topics included range from descriptive statistics, including measures of central tendency and fundamentals of measurement, to inferential statistics and advanced analytic methods.*

Stewart, David W. & Shamdasani, Prem N. (1990). *Focus Groups: Theory and Practice*. Newbury Park, CA: Sage.

This volume pays considerable attention to the fact that focus groups are by definition an exercise in group dynamics, which must be taken into account when conducting such groups and especially when interpreting the results obtained. It also covers practical issues like recruitment of participants, the role of the moderator, and appropriate techniques for data analysis.*

Yin, Robert K. (1989). *Case Study Research: Design and Method*. Newbury Park, CA: Sage.

While arguing eloquently that case studies are an important tool when an investigator (or evaluator) has little control over events and when the focus is on a contemporary phenomenon within some real life context, the author insists that case-studies be designed and analyzed so as to provide generalizable findings. Although the focus is on design and analysis, data collection and report writing are also covered. *

*These references were taken from :

Stevens, F., Lawrenz, F., Sharp, L. (1993). *User-Friendly Handbook for Project Evaluation: Science, Mathematics, Engineering and Technology Education* (Chapter 8). Alexandria: National Science Foundation.

V. Web Sites

The Center for Teaching and Learning Support
<http://www.hull.ac.uk>

British home page which provides a link to the European scene. It also has a subheading which provides international education/technology Internet listings. Includes a distance learning page and a "computer assisted assessment" which enables you to generate an assessment exercise.

Instructional Technology Resources

<http://interact.uoregon.edu>

Listings of various associations connected with education and technology, discusses EdTech research, and has an on-line resource center. Topics under "research" heading include Edweb and the K-12 Internet Testbed, a site where you can learn more about education policy and reform.

Technology Education Resources

<http://ed1.eng.ohio-state.edu/TechEdRes.html>

This site provides seven categories of valuable resources: Journals and Magazines, Vendors, Professional Organizations (Apple, Microsoft), Content Resources (MIT; NASA Spacelink), Gophers, LISTERVs (technology groups that you can subscribe to), and Newsgroups. Each entry has numerous selections. Technology Education Resources is a one stop shop for basic information needs.

Technology for the Classroom

<http://tiger.coe.missouri.edu/tech.html>

Includes headings for different journals, innovative academic uses for the Internet, and Scholastic's electronic learning. Site is oriented toward teachers who are looking for resources for their classrooms.

World Wide Web Virtual Library: Educational Technology

<http://tecfa.unige.ch/info-edu-comp.html>

This site has a separate page discussing educational software and lists current technology-related research projects.

Appendix C

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TECHNOLOGY LEARNING CHALLENGE GRANTS

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Appendix D

SAMPLES OF PLANNING AND DATA COLLECTION INSTRUMENTS

This appendix provides examples of planning and data collection instruments that might be useful models for a progress assessment. Primary sources and authors are listed for each; for further information about particular instruments, please contact the authors or RAND staff.

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Assessing Needs and Setting Goals

From the San Mateo Challenge Grant proposal, 1995

SYSTEMATIC AND SYSTEMIC SHIFTS

*All of the proposed systemic and systematic changes outlined below
are driven by the overarching goal of providing an educational program
which maximizes the unique talents, skills, and needs
of each child and his/her
family system.*

WHERE WE ARE NOW

1

- Student enters into and moves through system organized by age/grade, segmented into discrete units and varying geographical locations
- Limited information available about the child, family, and learning needs
- No clearly identified support system that ensures that student is succeeding throughout educational career
- Limited support for families during student's K-12 experience

2

- Fuzzy awareness of what 'bottom line' is in the educational process
- Use of unrelated, state developed criteria to assess student performance
- Student often has little responsibility in assessment process

3

- Technology limited and outdated
- Often students more proficient than teachers
- Communication limited among students, homes, teachers, administrators, other schools, business/industry, and the world at large

WHERE WE NEED TO BE

- At any time or age that a student enters BVLC system, the student is assessed using Student Learning Profile (*)
- Systems in place which allow for on-going reassessment of who the student is becoming and what human and educational resources will ensure continued success
- Unified organizational structure which allows for student progress through a seamless learning environment where instruction supports learning
- Established strong support systems for families

- Established rubrics of world class performance standards which clearly relate to ongoing instruction
- Consistent performance standards across Consortium
- Variety of authentic assessment measures based on real life situations
- Assessment occurs at various levels of mastery throughout the student's educational program
- Student assumes active role in self-assessment and goal setting

- State of the art technology, incorporating voice and electronic modalities and ongoing training and maintenance to support it
- All Consortium members proficient in the use of technology so that:
 - collaborative communication among all members of Consortium can occur easily
 - all students have access to information and resources now only available at libraries and resource centers
 - all students retain lifelong learning opportunities
 - all members may engage in distance learning opportunities

(*) See glossary

To accomplish our vision we have identified 19 areas which target instructional reform through systematic and systemic change. These focus on both the students and adults within the learning community. Included are:

- World class benchmarks and standards
- State of the art technology
- Professional development and interprofessional relationships
- Re-engineered human and financial resources
- Strengthened family, business, and community partnerships within and across the Consortium

HOW WE WILL GET THERE	RESOURCES WE NEED
• Develop intake system which screens student and family in Pre-Placement Class (*) where interests, talents, skills, and needs are evaluated • Develop on-going assessment systems (support and progress) to ensure student is meeting Learning Profile goals • Restructure the consortium into K-12 Learning Families (*) and Child Advocate Teams (*) • Assign student to Child Advocate Team and Learning Family within Consortium. This family will support student throughout educational career • Expand and develop parent support/education • Develop Decision Tree project (*), and other medical and allied medical connections within BVLC • Build an electronic network that facilitates communication, promotes learning, and accesses resources	• Time to create in-take and on-going assessment systems • Time to restructure into Learning Families and Child Advocate Teams • Time and resources to implement Decision Tree project across Consortium • Time to develop other medical collaboratives • Electronic tools and training to use them • Time to plan, expand, and develop support programs for Consortium families and community
• Develop benchmark standards and performance rubrics through collaboration with business and community • Develop Student Learning Profile which includes rubric information • Develop assessment tools that include real and simulated life application • Develop Student Advocate systems which continuously monitor individual student progress • Provide training for learning facilitators and students which focuses on student centered assessment (including individual rubrics, goal setting, short term objectives, and criteria for success)	• Time to develop benchmark world class standards across Consortium • Time to develop Student Learning Profile • Time to develop structure for Student Advocate Teams across Consortium • Electronic communication to facilitate involvement of Consortium members in development of assessment tools • Time to train learning facilitators and students in student centered self-assessment strategies
• All students, learning facilitators, parents, Community Members (*) have access to, and are trained in the use of state of the art computer/electronic technology • Provide access to electronic resources for all community members. • Include in instructional day time for community members to communicate both in person and electronically • Begin staff/community program that teaches about the value of collaborative communication • Train all students to access world-wide information through electronic tools	• Fiber-optic network linking all ten consortium sites with one another and the world • Several state of the art workstations in each classroom • Electronic notebooks for learning facilitators • Technology training for all community members • Support for ongoing maintenance and hardware upgrade, software, network • Appropriate software • Professional development time

4

- Language arts and other curricula taught as separate subjects using traditional information assimilation (lecture type) formats

- Language Arts and other curricula become integrated around authentic problems with well defined tool/application performance standards. These performance standards include academic, personal, interpersonal growth and breadth of human intelligences.
- Access to electronic communication to connect students with the resources in the world.

5

- Student/teacher ratios as high as 36 to 1
- Teacher as director of instruction

- The concept of "teacher" expanded to include parents, industry, professional and business personnel, as well as other elementary secondary, and post secondary students
- Apprenticeships and mentorships as viable options
- Teacher as "learning facilitator"

6

- Curriculum that is not continuous across subject, grade, schools, and time and often unrelated to real life needs

- Instruction that teaches tools and their application in uninterrupted, flexible time frames, using thematic integration
- Instruction that is continuous and built upon previous learning is emphasized across consortium
- Students demonstrate mastery as designated by the benchmark rubric before progressing

7

- Student personal and interpersonal development not given aggressive instructional emphasis

- Ethical standards and interpersonal skills as an integral part of the curriculum

8

- Educators struggling to meet the diverse needs of ALL learners because of difficulty teaching to the myriad of student differences
- Students categorically placed which separate opportunities, materials, manpower, and funds
- Home support often limited

- ALL learners offered equal access to, and included in learning situations that honor their learning styles, talents, needs, and potentials
- Parents educated to become partners

BEST COPY AVAILABLE

9

- Lack of understanding across ethnic/racial groups
- Isolated multicultural experiences, mandated by districts, not infused into general curriculum
- Few instructors proficient in first/second language acquisition

- Multicultural approach to learning which incorporates cultural diversity into subjects such as social studies, art, music, history, and literature
- Building of acceptance of multiple perceptions
- Instruction and curriculum which emphasizes inclusion of all kinds of differences: gender, race, ethnicity, class, physical ability, religion, and learning ability

HOW WE WILL GET THERE

RESOURCES WE NEED

- Work with business, community partners to establish benchmark performance standards for communication skills.
- Create creative problem solving instructional formats which integrate standards across curriculum.
- Continuously improve standards and instruction assessment with real world.

- Time for reengineering standards of instruction and assessment
- Two way business/community internships to integrate real world experiences/expectations.

- Designate credentialed instructor to facilitate training of community resource personnel permitting them to guide learning in areas of expertise for groups of individual students
- Establish partnerships with businesses whose employees will act as role models and mentors for children

- Business leaders who will work with assigned Consortium members to develop career exposure opportunities for students
- Members of the extended community to volunteer time and expertise at school and job sites

- Identify planning teams within curriculum areas and across schools within Consortium
- Restructure use of time in school day and role of instructor
- Use Learning Profile rubric and Learning Family Team
- Develop communication system within and across all areas of Consortium

- Adequate team planning time
- Electronic communication across Consortium
- Outside consultants in areas of expertise

- Integrate interpersonal skill training throughout the curriculum
- Use simulations and real-life immersion experiences to empower children in areas of ethical and interpersonal development
- Engage students/staff in ongoing boundary breaking activities that teach risk-taking and build inner strength and problem solving skills

- Staff development programs
- Consultation with other Consortium member institutions who have already developed curriculum techniques and strategies to share
- "Outward Bound" immersion programs
- Mentor role models from the community

- Initiate ongoing teacher training in learning style instruction and experiential education
- Train learning facilitators to recognize atypical development and know when, how, and where to refer for help
- Develop experience-based educational programs which maximize each student's potential.
- Share and expand upon already available curriculum and instructional materials across Consortium
- Expand dialog with SJSU professional preparation programs to discuss how best to prepare educators to meet diverse needs of all students
- Identify "lab" sites within Consortium where preservice and in-service teachers can benefit from outstanding models of learning facilitator practices.
- Create linkage between current district professional support programs and SJSU professional preparation program, so that professional development is on a seamless continuum from beginning preparation to retirement

- Professional development programs that make use of members expertise across Consortium
- Training for all educators in Decision Tree Program*
- Expand SJSU university program involvement to include secondary teacher and administrator preparation as well as the Concurrent Multiple Subject/Learning Handicaps Credential program, (already involved)

- Team planning to integrate curriculum areas that promote opportunity for transfer of information to real life and build personal connection between the student and real life, emphasizing global issues and complexity.
- Immersion activities emphasizing cross-cultural experiences

- Internet access
- Community immersion resources
- Conflict resolution training
- Peer counseling programs



WHERE WE ARE NOW

WHERE WE NEED TO BE

10

- Extremely limited medical and allied medical/educational collaboration to meet student needs

- Promotion of ongoing medical and allied medical collaboration
- Educators have easy, on-going access to medical and allied medical community for consultation

11

- Superficial coordination of home, community, other schools, and university resources

- Deeply interwoven network of home, community, business, and educational facilities that allow the student, family and community to use a variety of resources

12

- Teacher assessment currently limited to review and evaluation by site administrator

- Learning facilitators' assessment expanded to include active participation in their own evaluations
- Goals for professional growth and evaluation of the goals set collaboratively

13

- Education occurring with little regard for what is needed to succeed in today's business world

- Education working in partnership with business to assure that students are competent, trained workers when they complete their "formal" schooling years

14

- Compensation based upon tenure and years of service

- Expand ways in which teachers can be remunerated and supported

15

- Limited opportunity for teachers to assume other roles within the educational setting

- Expansion of potential roles and responsibilities for teachers within the Consortium

16

- Teachers, within and across schools, working as independent agents with varying degrees of support by those who administer them

- Teachers and administrators across the consortium working as one team using participatory management strategies
- Sharing and supporting of common goals across Consortium
- Assuring each student supported by entire system as she/he moves around within it

17

- Limited standardization of program evaluation and correction of system problems across district
- Program assessment typically done school by school, district by district
- No relationship between school program evaluation and university teacher preparation

- Program assessment across Consortium using state of the art quality control methods to identify and correct problems in the system as they emerge

(*) See glossary

HOW WE WILL GET THERE

RESOURCES WE NEED

• Provide professional development in understanding importance of medical - educational connection • Provide training in use of Decision Tree Model for collaborative consultation across medical/allied medical and educational personnel • Develop systems for increased collaboration among educational and medical/allied medical professionals	• Consultation and training among Consortium members and medical/allied medical personnel • Decision Tree Program • Electronic communication across Consortium
• Develop a database of material and human resources • Create a system to access resources across Consortium	• Team building time across Consortium • Time for and assistance with database development • Time to develop resource access system
• Initiate learning facilitator self-assessment process for all members of the Consortium including university • Members of the Consortium work together to develop a uniform process for professional development and review that is based on student performance related to benchmark standards • Experience based professional development programs throughout the consortium with participation of concurrent credential teacher trainees and professors	• Planning time for Consortium to develop the uniform process
• Partnerships between business and the Consortium in which we: 1. Make evaluations regarding what business requires from students in order for them to be effective workers 2. Do long-range planning to make sure that education and business are aligned with respect to future needs 3. Cooperate with business to assist in training, facilitating current population of employees	• Designated business and educators to work together
• Establish committee to begin process of communication and mutual understanding between union leaders and union members within Consortium	• Team of representatives using industry expertise and advice
• Learning facilitators (including university professors) serve within the Consortium in different capacities, (i. e. adjunct professor, full time teacher advisor to beginning learning facilitators, coordinator of experiential learning programs, business liaison, parent support coordinator, child advocate, etc.)	• Time to develop the roles, responsibilities, ways, and means for new educator roles
• Build learning families across Consortium that will establish meeting times for short and long term planning, reflection and assessment of there work	• Time for learning families to develop flexible schedules ongoing planning time
• Identify process that identifies strengths and weaknesses across Consortium and permits dissemination of resources	• Development and implementation time for system wide process evaluation • Industry consultant for assistance with quality control development

WHERE WE ARE NOW

18

- Funding allocated to districts by average daily attendance
- Categorical funds limited and designated for special programs and populations to be served, e.g. Special Education, Gifted education
- Individual schools compete for funds, often for overlapping programs

19

- Limited two-way communication between California Department of Education and schools in the community

WHERE WE NEED TO BE

- Funding based upon a system that shares resources and directs funds where needed within the Consortium

- Ongoing two-way communication system that allows state and local districts to inform each other so that they can better work together to solve identified problems

MANAGEMENT

Adapting the same model used to develop this proposal, The Blossom Valley Learning Consortium will be directed by a Consortium Council. The Council of 24 members will be elected by their peers for staggered two year terms.

Policy/decision makers will include:

- 1 representative from each member educational institution
- 1 representative from each of four governing bodies
- 6 representatives from industry/community partnerships
- 4 student representatives

The Council will appoint a 5 member Steering Committee from its membership to administer the program and attend to day-to-day program operation.

The Consortium Council will have the following major responsibilities:

- 1) Establish time line for implementation of changes
- 2) Ensure that expected outcomes are achieved through the educational programs.
- 3) Provide for the health, safety and well being of students and staff
- 4) Develop and maintain working relationships with parent organizations
- 5) Consider allocation of resources, prepare and submit proposed budgets, provide incentives for success
- 6) Provide timely information to constituencies (public relations and annual reports, newsletters and videos)
- 7) Conduct quarterly progress meetings open to staff and constituents
- 8) Ensure systems changes, seek waivers, reinvent relationships
- 9) Evaluate progress and maintain continuous improvement process
- 10) Develop and implement a business plan built around measurable outcomes
- 11) Establish and sustain a vital research and development component
- 12) Develop a system for fiscal and resources management
- 13) Establish a plan for human resources management

HOW WE WILL GET THERE

RESOURCES WE NEED

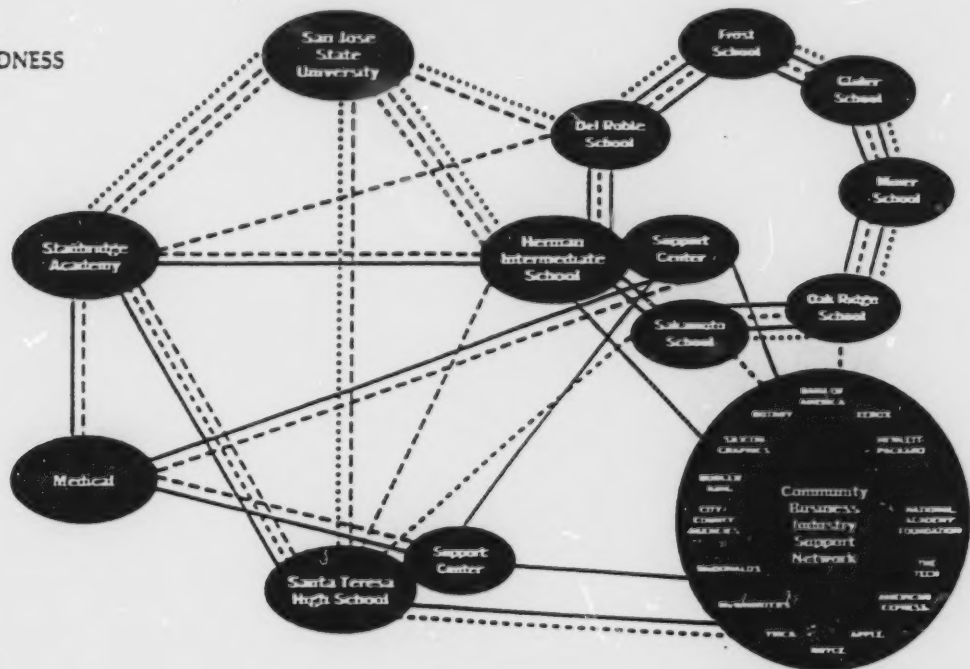
- Vehicle established to develop a pool of additional sources of funds that can support the goals of the BVLC

- Designated partnership of educational and business to explore and recommend additional grants, foundations and other sources of funding to ensure the completion of the BVLC goals and to sustain these efforts for long term

- Open lines of communication that promote mutual understanding and support
- Establish a team of "ambassadors" made up of business leaders and Consortium members working with key legislators and the California Department of Education

- Team of "ambassadors" (business leaders and Consortium members)

RESOURCE INTERCONNECTEDNESS



- Computer Network
- Medical Network
- Transportation Network
- Community/Support Network
- · — · — SJSU Student Teacher Network



The vision also includes bold new systems for "managing the process", ensuring long term excellence, and sustaining continuous improvement.

We are pursuing implementation of the Malcolm Baldrige Template application. Here, too, we pursue benchmark standards of excellence to assure the quality of our process.

EVALUATION

Evaluation of these plans to reinvent education will be tough, thoughtful and directed. The evaluation will be based on achievement of simple, rigorous, profound objectives established on a yearly basis and included in a Consortium Plan. The Consortium Plan will be established and published each April. It will be prepared by the Consortium Council with industry/community involvement.

Objectives will include the following categories:

- 1) Achievement of rigorous, measurable student objectives with special emphasis on Language Arts achievement
- 2) Communication through technology (tools of the day) as it affects student achievement and staff performance
- 4) Support services (tutoring services, alternative learning environments, medical diagnoses, social services, family/community partnerships)
- 5) Professional staff development
- 6) Governance process
- 7) Quality assurance (Malcolm Baldrige)
- 8) Business/community/agency partnerships
- 9) Systems Reengineering
- 10) Refining existing rules, regulations and organizational structures which currently govern education
- 11) Inclusion/involvement of constituent groups

**Implementation Plan and Benchmarks: Sample MRSB Technology
Implementation Timeline**

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Sample Modern Red Schoolhouse Technology Implementation Timeline, 1995.
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Chart 4
Sample MRSh Technology Implementation Timeline

	Years 1 - 2	Years 3 - 4	Year 5
School-based Planning Oversight	School-based technology committee formed; teachers usage, equipment inventory, and implementation plan developed	Committee monitors installation, training and usage	committee monitors installation, training, and usage
"Classroom" Equipment	Install LAN including data, voice and video cabling, file server (s), operating software, and network modems/supporting phone lines 100 percent of classrooms receive teacher-based multi-media computer with presentation monitor and printer 40 percent of classrooms/subject areas receive student computers equaling (1:6 student ratio) Acquire peripheral supports (e.g., video cameras, scanners, laser disc players to equal 1:10 teacher ratio) Additional phones acquired (equaling 1:10 teacher ratio)	Maintain LAN Acquire additional computers as necessary 80 percent of classroom/subject areas receive student computers (1:6 student ratio) Acquire additional peripheral supports to equal 1:7 teacher ratio Additional phones acquired (equaling 1:5 teacher ratio)	Maintain LAN Acquire additional computers as necessary 100 percent of classroom/subject areas receive student computers (1:6 student ratio) Acquire additional peripheral supports to equal 1:4 teacher ratio Additional phones acquired (equaling 1:1 teacher ratio)
Other Equipment	Administrative/office equipment (e.g., fax, laser printer)	Media center collections placed on LAN Satellite and cable connections and equipment installed	General access lab(s) equipped/upgraded and hooked onto LAN Acquire in-house video production equipment
Software	Establish maintenance contracts or Acquire software: IMS, MIS, e-mail, integrated productivity tools, and instructional packages	On-going maintenance contracts/support On-going software review and acquisition	On-going maintenance contracts/support On-going software review and acquisition
Training/Support	Identify funds to hire school-based technology coordinator/trainer Provide for initial "basic" training for all school personnel	Continue/expand school-based coordinator On-going basic and advanced training	Continue/expand school-based coordinator On-going basic and advanced training

**Teacher Survey:
Modern Red Schoolhouse Teacher Survey**

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MODERN RED SCHOOLHOUSE TEACHER SURVEY

Please indicate your responses by marking your answers directly on this questionnaire.

Project Effectiveness

Please provide your best estimate of how the Modern Red Schoolhouse design has improved your school in the following areas: (Circle either, "3, 2 or 1").

	A lot	Some	None
1. Teachers use of technology in their classrooms	3	2	1
2. Teachers' roles in making school decisions	3	2	1
3. School autonomy	3	2	1
4. Leadership skills	3	2	1
5. Parent involvement	3	2	1
6. Community involvement	3	2	1
7. Students' engagement with learning	3	2	1
8. Achievement levels of all students	3	2	1

Please indicate how well you understand each of the following Modern Red Schoolhouse concepts. (Circle the number that best describes your judgment of how well you understand each concept.)

THE FOLLOWING WILL BE DROPPED AND PASTED IN ON A DIAGONAL

- 5 = Very clearly 2 = Not clearly
 4 = Clearly 1 = Does not apply to my school.
 3 = Somewhat

9.	MRSH standards	5	4	3	2	1	
10.	Core Knowledge curriculum.		5	4	3	2	1
11.	Work force skills	5	4	3	2	1	
12.	Character development through establishing core virtues with community.	5	4	3	2	1	
13.	School autonomy	5	4	3	2	1	
14.	Developing a staffing structure that matches needs of students	5	4	3	2	1	
15.	Continuous progress to all students	5	4	3	2	1	
16.	The Individual Education Compact (IEC)	5	4	3	2	1	
17.	Technology and information networks	5	4	3	2	1	
18.	Primary, Intermediate, and Upper divisions	5	4	3	2	1	
19.	Parental choice	5	4	3	2	1	
20.	Hudson Units	5	4	3	2	1	
21.	Watershed assessments	5	4	3	2	1	
22.	Student Reports	5	4	3	2	1	
23.	School Reports	5	4	3	2	1	
24.	Pre-school consortium	5	4	3	2	1	
25.	Parent involvement	5	4	3	2	1	
26.	Parental Information Centers	5	4	3	2	1	
27.	Community support services for students	5	4	3	2	1	

Please indicate the extent to which each of the following Modern Red Schoolhouse concepts is observable at your school. (Circle the number that best describes the level at which each listed concept is in place at your school).

5 = implemented fully.

4 = implemented to a large degree.

3 = implemented to a moderate degree.

2 = minimally implemented.

1 = has not been implemented.

28.	MRSH standards	5	4	3	2	1
29.	Core Knowledge curriculum	5	4	3	2	1
30.	Work force skills	5	4	3	2	1
31.	Character development	5	4	3	2	1
32.	School autonomy	5	4	3	2	1
33.	A staffing structure that matches needs of students	5	4	3	2	1
34.	Continuous progress to all students	5	4	3	2	1
35.	The Individual Education Compact (IEC).	5	4	3	2	1
36.	Performance grouping		5	4	3	2 1
37.	Multi-age homerooms		5	4	3	2 1
38.	Technology and information networks	5	4	3	2	1
39.	Primary, Intermediate, and Upper divisions	5	4	3	2	1
40.	Parental choice to attend this school	5	4	3	2	1
41.	Hudson Units	5	4	3	2	1
42.	Watershed assessments	5	4	3	2	1
43.	Student Reports	5	4	3	2	1
44.	School Reports	5	4	3	2	1
45.	Pre-school consortium	5	4	3	2	1
46.	Parent involvement	5	4	3	2	1
47.	Parental Information Centers	5	4	3	2	1
48.	Community support services for students	5	4	3	2	1

Please provide your best estimate of the degree to which the academic achievement of your students has been improved by these Modern Red Schoolhouse elements.

5 = Big Positive improvement in academic achievement.

4 = Mostly Positive improvement in academic achievement.

3 = Neither a Positive or a Negative improvement in academic achievement.

2 = Mostly Negative effects on academic achievement.

1 = Big Negative effects on academic achievement.

0 = Not implemented at this time

49.	MRSH standards	5	4	3	2	1	0
50.	Core Knowledge curriculum	5	4	3	2	1	0
51.	Work force skills	5	4	3	2	1	0
52.	Character development	5	4	3	2	1	0
53.	School autonomy	5	4	3	2	1	0
54.	A staffing structure that matches needs of students	5	4	3	2	1	0
55.	Continuous progress to all students	5	4	3	2	1	0
56.	The Individual Education Compact (IEC).	5	4	3	2	1	0
57.	Performance grouping		5	4	3	2	1 0
58.	Multi-age homerooms		5	4	3	2	1 0
59.	Technology and information networks	5	4	3	2	1	0
60.	Primary, Intermediate, and Upper divisions	5	4	3	2	1	0
61.	Parental choice to attend this school	5	4	3	2	1	0
62.	Hudson Units	5	4	3	2	1	0
63.	Watershed assessments	5	4	3	2	1	0
64.	Student Reports	5	4	3	2	1	0
65.	School Reports	5	4	3	2	1	0
66.	Pre-school consortium	5	4	3	2	1	0
67.	Parent involvement	5	4	3	2	1	0
68.	Parental Information Centers	5	4	3	2	1	0
70.	Community support services for students	5	4	3	2	1	0

How often do some students demonstrate the following behaviors in your classroom?

WILL BE DROPPED AND PUT ON A DIAGONAL

3 = Everyday

2 = Several times a week

1 = Less than once per week

71.	Students bring items from home which support school studies	3	2	1
72.	Students finish work and have nothing to do	3	2	1
73.	Students work in small groups to solve complex problems	3	2	1
74.	Students talk about what they learn in class outside of the classroom	3	2	1
75.	Students are frustrated and confused over assignments	3	2	1
76.	Students complete work and don't know what to do next	3	2	1
77.	How often do you practice the following in your school?			
	Students are provided extra learning time if they need it or want it	3	2	1
	Student assessment results are used for instructional diagnosis and to find out if teaching methods are working	3	2	1

About how often do some students in your classroom do the following?

WILL BE DROPPED AND PUT ON A DIAGONAL

5 = *Every day*

4 = *Once or twice a week*

3 = *Once a month*

2 = *Hardly ever*

1 = *Never*

78.	skip class	5	4	3	2	1	
79.	misbehave and disrupt others from learning	5	4	3	2	1	
80.	work one-on-one with you	5	4	3	2	1	
81.	work with another student having a different skill-level in a particular subject	5	4	3	2	1	
82.	work alone	5	4	3	2	1	
83.	read books that are not assigned	5	4	3	2	1	
84.	obtain assistance from an adult volunteer or other staff member	5	4	3	2	1	
85.	decide how to present what it is they have learned.		5	4	3	2	1
86.	use computers to support academic activities.	5	4	3	2	1	
87.	use the school library to find resources for projects.		5	4	3	2	1

School Climate

Following are a number of statements that might be made about your school. Please indicate your level of agreement with the statement by circling a number between 1 and 5 on the scale located to the right.

		Strongly Agree			Strongly Disagree		
88.	The school has a written mission statement that is shared by all stakeholders.	5	4	3	2	1	
89.	This school's mission statement makes direct reference to teaching and learning for all.	5	4	3	2	1	
90.	What must be learned, and who is accountable, is clear at this school.	5	4	3	2	1	
91.	The climate of the school reflects the belief that all students can succeed.	5	4	3	2	1	
92.	School goals and objectives are clearly stated in a way that provides direction	5	4	3	2	1	
93.	School goals and objectives are achievable.	5	4	3	2	1	
94.	School goals and objectives are translated into action plans by staff.	5	4	3	2	1	
95.	At this school we are trying to build a community of shared values and beliefs.	5	4	3	2	1	
96.	This school fosters a sense of ownership and leadership among staff by involving them in decisions about the school and school programs.	5	4	3	2	1	
97.	I am satisfied with the level and nature of my involvement in decision-making.	5	4	3	2	1	
98.	In this school I am encouraged to experiment with my teaching.	5	4	3	2	1	

Following are a number of statements that might be made about your school. Please indicate your level of agreement with the statement by circling a number between 1 and 5 on the scale located to the right.

	Strongly Agree				Strongly Disagree
99. Teachers at this school have high expectations for their own performance.	5	4	3	2	1
100. At this school there are a broad array of teaching strategies being implemented.	5	4	3	2	1
101. Staff morale is high—administrators, teachers, and other school staff exhibit pride in the school.	5	4	3	2	1
102. Student morale is high—students exhibit pride in the school.	5	4	3	2	1
103. We have the tools to appropriately monitor student progress at this school.	5	4	3	2	1
104. Student progress is best measured through the use of norm-referenced tests.	5	4	3	2	1
105. Results of measurements of student progress are appropriately used to improve individual student performance and guide instruction.	5	4	3	2	1
106. This school has good alignment between the written, taught and tested curriculum.	5	4	3	2	1
107. This school is making good use of technology by both teachers and students to monitor learning progress.	5	4	3	2	1
108. This school is making an appropriate move toward more authentic forms of assessment.	5	4	3	2	1

Following are a number of statements that might be made about your school. Please indicate your level of agreement with the statement by circling a number between 1 and 6 on the scale located to the right.

	Strongly Agree					Strongly Disagree				
109. The atmosphere of this school is professional.	5	4	3	2	1					
110. The environment of this school is conducive to learning.		5	4	3	2	1				
111. Students at this school work well together.	5	4	3	2	1					
112. Teachers at this school express a good deal of collegiality among their peers.	5	4	3	2	1					
113. Leadership abilities are nurtured at this school for both teachers and students.	5	4	3	2	1					
114. School and classroom environments are safe for people and property.	5	4	3	2	1					
115. Staff accept and take responsibility for school rules and standards.	5	4	3	2	1					
116. Students accept and take responsibility for school rules and standards.	5	4	3	2	1					
117. I have a sense of satisfaction in my professional role and feel I have a positive impact on students.	5	4	3	2	1					
118. Staff members are recognized for a job well done.	5	4	3	2	1					
119. Parents understand and support the mission of this school.	5	4	3	2	1					
120. Parents volunteer as much as they need to at this school.	5	4	3	2	1					

Following are a number of statements that might be made about your school. Please indicate your level of agreement with the statement by circling a number between 1 and 6 on the scale located to the right.

	Strongly Agree					Strongly Disagree				
121. This school is working adequately on building authentic partnerships with parents on issues pertaining to school governance.	5	4	3	2	1					
122. This school is adequately working on building authentic partnerships with parents on issues pertaining to student learning.	5	4	3	2	1					
123. This school offers parents training in how to support their children's learning.	5	4	3	2	1					

In comparing student behavior in your classroom this academic with the previous year, what is your best estimate of the following:

Student attendance is --

- ☐ better ☐ worse ☐ the same

Student interest in learning --

- ☐ better ☐ worse ☐ the same

Student misbehavior --

- ☐ better ☐ worse ☐ the same

124. *In general, how would you now characterize your support of the Modern Red Schoolhouse program in your school? Please circle one response.*

Strong Support	Moderate Support	Slight Support	Slight Opposition	Moderate Opposition	Strong Opposition
6	5	4	3	2	1

Below are questions that are intended to gather information about parents as a group. Please complete the following information about you. (Circle the letter that applies).

125. Sex: (A) Male (B) Female
126. Ethnicity (A) Caucasian (B) Latino (C) Native American
(D) Black (E) Asian (F) Other
127. How many years including this one have you participated in the *Modern Red Schoolhouse* project?
- A. Since our school considered joining, 1992.
B. Fall, 1993.
C. Fall, 1994.
D. Other, please specify: _____
128. Please indicate whether or not you participate in any state or district performance pay or incentive wage program.
- A. I do participate in a performance pay or incentive wage program.
The name of the program is: _____
- B. I do not participate in a performance pay or incentive wage program.
129. How many years of *full-time* teaching experience do you have?
- A. More than 20 years.
B. 15 - 19 years.
C. 10 - 14 years.
D. 5 - 9 years.
E. 1 - 4 years.
130. How many years have you taught bilingual/LEP/bicultural students (including

this year)? _____ years or,
☐ I have never taught bilingual/LEP/bicultural students.

Academic/Professional Background**131. What is the highest degree you have received?**

- | | |
|---|-------------------------------|
| (A) Bachelor's + teaching credential | (D) Master's + units beyond |
| (B) Bachelor's + some units beyond credential | (E) Doctorate |
| (C) Master's | (F) Other (specify) _____ |

132. Please indicate your certification and the subjects, grade levels, and specialties for which you are qualified: (Check all that apply)

- A. State Department of Education. Please name the states: _____

- B. National Board for Professional Teaching Standards. Please name the subjects: _____
- C. Other, please specify): _____

- D. I am not certified by any legal entity as of the date of this survey.

133. Please indicate which teaching credentials you have and specify the content area of specialization. (Circle all that apply.)

- | | |
|--------------------------|-------------------------|
| (A) General Elementary | (E) Single Subjects |
| (B) General Secondary | (F) Bilingual |
| (C) Special Emergency | (G) Early Childhood |
| (D) Multiple Subject | (H) Special Education |
| | (I) Other: _____ |

If you have any other comments about the positive or negative effects of the Modern Red Schoolhouse program in your school, please provide them in space provided below.

THANK YOU FOR YOUR COOPERATION IN COMPLETING THIS SURVEY.

Teacher Survey

Reprint by permission from *Tracking Your School's Success: A Guide to Sensible Evaluation*, Resource B: Sample Teacher Survey, 1992.
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Resource B: Sample Teacher Survey

Please indicate your responses by checking, circling, or filling in the blanks.

1. Sex: ☐ M ☐ F
2. Ethnicity ☐ Caucasian ☐ Latino ☐ Native American
 ☐ Black ☐ Asian ☐ Other _____
3. How many years *including this one* have you participated in the project? _____

Academic/Professional Background

4. What is the highest degree you have received?
☐ Bachelor's + teaching credential ☐ Master's + units beyond
☐ Bachelor's + units beyond credential ☐ Doctorate
☐ Master's ☐ Other (specify) _____
5. Please indicate which teaching credentials you have and specify the content area of specialization. (Check ALL that apply.)
☐ General Elementary ☐ Single Subjects
☐ General Secondary ☐ Bilingual
☐ Special Emergency ☐ Other _____
☐ Multiple Subject
6. How many years of teaching experience do you have? _____ years
7. How many years have you taught bilingual/LEP/bicultural students (including this year)? _____ years
8. Please characterize your current class(es):
a. Grade level: _____
b. Language(s) of instruction: 1. Mostly Spanish 2. Mixed 3. Mostly English
c. Subject: _____ (Junior High only)

9. How would you characterize your effectiveness in teaching language arts to your current students?

Low
1

2

3

4

Extremely
High
5

Project Effectiveness

10. Please rate the effectiveness of the project in each of the following areas:

	Poor		Adequate		Very Effective	NA
a) Communication with team members	1	2	3	4	5	6
b) Communication across teams	1	2	3	4	5	6
c) Motivating teachers to use technology in their classrooms	1	2	3	4	5	6
d) Making technology available in classrooms	1	2	3	4	5	6
e) Involving teachers in project decision making	1	2	3	4	5	6
f) Project management and organization	1	2	3	4	5	6
g) Project leadership	1	2	3	4	5	6
h) Project in-services	1	2	3	4	5	6
i) Work-study sessions	1	2	3	4	5	6
j) Operation of your Tech Center	1	2	3	4	5	6
k) Overall effectiveness of the project	1	2	3	4	5	6

Training

11. How effectively do you feel you have been trained by the program in the following areas?

	Poor		Adequate		Very effective	NA
a) Curriculum development	1	2	3	4	5	6
b) Use of equipment	1	2	3	4	5	6
c) Use of software	1	2	3	4	5	6
d) Language arts instruction	1	2	3	4	5	6
e) Integrating technology and language arts	1	2	3	4	5	6
f) Using technology with language minority students to meet your bilingual program's goals	1	2	3	4	5	6

12. How much follow-up and assistance has the project provided you in the following areas?

	None		Some		A Great Deal	NA
a) Use of technology in instruction	1	2	3	4	5	6
b) Planning and developing curriculum units and activities	1	2	3	4	5	6
c) Becoming familiar with and learning about technology	1	2	3	4	5	6
d) Training students in equipment usage	1	2	3	4	5	6
e) Integrating the use of technology with bilingual instruction	1	2	3	4	5	6

Use of Technology

13. Approximately how much has your class used the Tech Center this school year?
_____ hours/week

14. On average, how much do you use technology as part of your regular classroom program (not including Tech Center time)? Please indicate which of these are permanently in your classroom:

		PERMANENTLY IN MY CLASSROOM
Video equipment	_____ hours/week	[]
Computer equipment	_____ hours/week	[]
Laser disc equipment	_____ hours/week	[]
Other: _____	_____ hours/week	[]

15. a. On average, how many hours a month do you spend doing the following project-related activities?

- | | |
|-------------|--|
| _____ hours | a) Participating in project meetings and in-services |
| _____ hours | b) Planning/developing instructional activities/curriculum units |
| _____ hours | c) Becoming familiar with technology on your own |
| _____ hours | d) Helping students in the use of the equipment during nonclass time |
| _____ hours | e) Other (specify) _____ |

b. About what percentage of this time is unreimbursed, nonschool time? _____%

16. How many times this school year have you shared your products and ideas with others?

- At conferences _____
- With non-MTS colleagues _____
- Informal presentations _____

Effects of Project

17. To what extent has your involvement in the project affected your expectations for your students' achievement?

Greatly Lowered 1	Slightly Lowered 2	Has Not Affected 3	Slightly Increased 4	Greatly Increased 5
-------------------------	--------------------------	--------------------------	----------------------------	---------------------------

Please explain: _____

18. How much of a difference (if any) has participating in the project had on your students' school-related attitudes and behaviors?

	None		Some		A Great Deal
a) Increased liking of school	1	2	3	4	5
b) Improved language arts skills	1	2	3	4	5
c) Improved confidence as a learner	1	2	3	4	5
d) Increased interest in technology	1	2	3	4	5
e) Improved student-teacher rapport	1	2	3	4	5
f) Increased participation in class	1	2	3	4	5
g) Improved student-student cooperation		1	2	3	45
h) Other (specify below):	1	2	3	4	5

19. Please rate the extent to which your involvement with the project has affected the following:

	None		Some		A Great Deal
a) Improved my overall teaching effectiveness	1	2	3	4	5
b) Improved my language arts instruction	1	2	3	4	5
c) Changed my perceptions about my students' learning abilities	1	2	3	4	5
d) Changed my instructional methods	1	2	3	4	5

Please explain these ratings:

a) _____
 b) _____
 c) _____
 d) _____

20. Please rate the extent to which you agree or disagree with each of the following statements:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a) I am enthusiastic about participation in this project.	1	2	3	4	5
b) Administrators at my school are generally supportive of the project.	1	2	3	4	5
c) My principal provides strong support for my teaching.	1	2	3	4	5
d) I feel a lot of stress at work.	1	2	3	4	5
e) I am satisfied with my work environment.	1	2	3	4	5
f) I feel excited by my students' accomplishments.	1	2	3	4	5
g) The project is helping me develop professionally.	1	2	3	4	5
h) I am developing teacher training skills.	1	2	3	4	5

21. How satisfied are you with your students' progress in the following areas?

	Highly Satisfied		Neutral		Dissatisfied
Reading	5	4	3	2	1
Math	5	4	3	2	1
Writing	5	4	3	2	1
Science	5	4	3	2	1
Social Studies	5	4	3	2	1
Peer Relationships	5	4	3	2	1
Self-Confidence	5	4	3	2	1
Cultural Sensitivity	5	4	3	2	1
Motivation for Learning	5	4	3	2	1

22. Please share your impressions of the project's accomplishments and/or how it may be improved:

THANK YOU!!

Principal Interview Guide

From *Special Strategies for Educating Disadvantaged Children*, Sam Stringfield, et al., U.S. Department of Education, Washington, DC, 1994

The purpose of the Special Strategies Study is to describe promising programs which could be used as alternatives to traditional Chapter 1 programs. As you know, your school was selected to be studied as an example of such a promising program. I am going to ask you some questions primarily intended to find out how and why your school's program came into being, what it is supposed to accomplish, and how it is in fact operating. This information will help our project to learn about the process of innovation, about which elements are typically seen in exemplary programs, and about obstacles to change and how schools can overcome them.

In answering these questions, please think about how they apply to students in your school at the grade level we are studying (1,3, or 9/10).

Program Design and Development

1. Confirm the name of the innovative program in the school: _____
—
2. What are the main problems the program is intended to solve?
3. When did planning for the program begin?
4. Who actually designed the program? Did the program originate within this school, or elsewhere?
5. What was your role in the development/adaptation of the program?
6. To what degree were the following people involved in originally designing the program for the school?
 - National researchers/developers (e.g., Comer, Sizer, Slavin)
 - Teachers
 - District Chapter 1 coordinator
 - Other district staff
 - Local non-district people (e.g., local university professors, parent groups)

What were their roles?

7. What are the key elements of the intended program? To what degree does the program involve changes in each of the following areas:
 - Curriculum
 - Instructional methods
 - Additional instructional staff or services
 - Additional non-instructional staff or services (e.g., counselors, social workers, etc.).
 - Adaptations to individual needs

- Groupings
- Time allocations, time use
- Class size
- Assessment
- Staff development
- Relationships among school staff
- Coordination among different staff
- Other

Content of the Special Strategy

8. What changes has the program introduced in the curriculum and instruction of the regular classroom?
9. To what degree are curriculum materials used in the regular classroom locally developed, as opposed to commercially available?
10. What specific commercially available materials are primarily used in the regular classroom?
11. Does the program provide any supplementary instructional services (such as tutoring, remedial instruction, computer-assisted instruction) beyond regular classroom instruction? If so, please describe them.
12. How similar are the curriculum materials mainly used in supplementary services to those used in the regular classroom? (e.g., same materials, same materials but different levels, different materials).
13. Do you consider the purpose of supplementary instructional services to:
 - Teach the same objectives as those taught in the regular class
 - Teach objectives similar to those used in the regular class
 - Teach objectives different from those taught in the regular class
14. When students receive supplementary instructional services, what is the usual group size?
15. For how much time do students receive supplementary services? (Minutes per day, days per week, weeks per year).
16. What instruction do the students miss when they are engaged in supplementary instructional activities?
17. With whom do program staff coordinate other instruction and services? How is coordination accomplished (e.g., joint preparation of lessons, common planning

time, informal meetings, shared records of student progress)? How effective does the coordination appear?

18. How many times per month are staff implementing this program expected to meet with each other to discuss plans or problems?
19. How many times per month do you (the principal) meet with the staff involved with this program to discuss plans or programs?
20. What programs exist in the school over and above those in the innovative program? To what degree are these programs integrated with others?

Selection of Students

21. To what degree are students selected into this school? Is the school a magnet? Does it accept or encourage students from outside of its neighborhood to attend? Can the school dismiss students who don't appear to fit into the school's philosophy? Are students selected for this particular program? If there is a school-within-a-school or students are otherwise selected to participate, how was this selection made, and how can it be changed if students either don't make it or do very well?
22. [If supplementary services are provided,] how are students selected to receive supplementary services? If different services are provided to different students, how is it decided who receives which services?
23. What specific criteria are used for entry to or exit from particular services?

Role of Parents

24. What is the school's outreach program for parents?
25. What are the formal and informal ways that parents are involved in the planning and operation of the program?
26. What opportunities, if any, are there for staff to work collaboratively with parents?

Staffing

For this program in this school, what categories of staff have been added to the program? Consider:

- Remedial reading or math teachers
- Tutors
- Aides/paraprofessionals
- Nurses
- Counselors
- Librarians
- Social Workers
- Parent liaisons, home-school coordinators
- Psychologists
- Additional teachers to reduce class size

For each job title, ask the following:

27. How many full-time or part-time staff do you have with this job title?
28. How are these positions funded (e.g, Chapter 1, Chapter 2, state compensatory education funds, special grants, local funds)?
29. Please describe the responsibilities of staff members with this job title.
30. What level of education or training is required for this position?
31. Who is involved in the decision to hire persons in that position?
32. Who is responsible for evaluating the performance of staff members in that position?

If this position is not instructional (e.g, counselor, social worker, parent liaison), go to item 34.

33. In what subject(s) do staff with this job title teach or assist?

34. What are the three most important goals the staff member (s) in this position are supposed to pursue? (Please rank 1 to 3)

Enhancing student achievement	_____
Increasing student self-esteem	_____
Improving student attendance	_____
Improving student behavior	_____
Improving student health	_____
Increasing parent involvement	_____
Helping teachers with non instructional tasks (e.g., paperwork)	_____
Improving student attitudes toward school	_____
Other (specify _____)	_____

35. How successful do you think the staff members in this position have been accomplishing the three top goals you just named?
36. To what degree do staff members in this position directly or indirectly assist regular classroom teachers to do a better job of teaching?
37. To what degree were teachers recruited to work in this particular school or program? (If program is school-wide, substitute school.) Is the teaching staff like that of any school in the district, or is it an unusual group brought together specifically to implement this program?
38. Who has provided training to teachers on implementation of the program? How much training has been provided, and how much more is planned?
37. Is there any procedure for helping staff implement changes in curriculum and instruction (e.g., expert coaching, peer coaching, teachers help each other, informal feedback to teachers).
38. Has the introduction of the program resulted in unusual levels of staff turn-over (e.g., staff deciding or being encouraged to leave the school, or the school becoming unusually attractive to prospective new staff?) If yes, please describe.

Budget

39. How much does the program cost to run? Does the school have funding over and above that provided to similar schools in the district? From what sources are program funds received? What proportion of funds come from each source? (We are not doing a detailed cost analysis, but would like solid estimates of budget figures). Are any changes in budget anticipated?

Program Effects

40. To what degree do you feel this program is accomplishing the following student outcomes?

	A GREAT DEAL	SOMEWHAT	NOT AT ALL
Enhanced Achievement	_____	_____	_____
Increased Self-Esteem	_____	_____	_____
Improved <u>Attendance</u>	_____	_____	_____
Improved Morale	_____	_____	_____

41. To what degree does the program appear to you to increase the quality of instruction students receive?

A great deal
Somewhat
Not at all

42. To what degree does this program increase the amount of time students receive instruction in reading, math or language?

A great deal
Somewhat
Not at all

43. To what degree does this program increase the amount of time students motivation to learn reading, math, or language?

A great deal
Somewhat
Not at all

44. To what degree does this program decrease the school's capacity to adapt instruction to the individual needs of the students?
- A great deal
Somewhat
Not at all
45. This program is primarily a _____ (reading or math or language/arts/writing program. To what extent is it also affecting other subjects (e.g., social studies, sciences, and the others not listed above)?

Implementation

46. What barriers have been encountered in implementing the program successfully? Consider:
- Problems with Federal, State, or district regulations
 - Opposition from key district, school, or other staff
 - Opposition from parents or other community members
 - Problems with teacher unions
 - Inadequate financial support
 - Inadequate preparation of teachers or other school staff(e.g., inadequate staff development, training)
 - Problematic relationships among school staff
 - Other
47. What forces have helped the program to succeed? Consider:
- Clear support/mandate from district, other political actions
 - Clear support from parents, community
 - Additional financial support
 - Excellent staff development and followup
 - Excellent relationships among staff
 - Outstanding principal and/or staff
 - Other

Replication

Extent of Implementation

48. When was the program first implemented?
49. How widely within the school is the original developer's vision truly shared? To what extent are school staff aware and supportive of the overall program direction?

Actual vs. Intended Program

50. To what degree do you feel that the program is being fully implemented as it was meant to be implemented?
- Fully implemented as intended
 - Fully implemented with important modifications (Please describe)
 - Partially implemented
 - Poorly or not implemented
51. What changes have been made or are contemplated from the original program plan?
52. What plans are formulated or being discussed for:
- Full implementation of all program elements
 - Modifications in the program
 - Expansion to other sites or within the same school

Replicability

53. If this school is an example of a widespread program, to what degree is it seen by the program developers as a special lighthouse school (e.g., frequently visited by potential adopters).
54. Has the program been replicated in other schools, or are there plans to do so?
55. Were this program to be replicated elsewhere, what conditions would have to exist for this to happen?

Parent Survey

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Resource A: Sample Parent Survey

Name: _____ F[] M[] Date: _____ Interviewer: _____
 Phone: () _____ Relationship to student (mother, father, guardian, etc.): _____
 Student's Name: _____ F[] M[] School/Teacher: _____ / _____
 Student's Grade Level: _____ Language of Interview: Spanish English Other: _____

1. What do you know about the Model Technology Program at your school? (Write exact quote)
2. Please answer the following questions by indicating the number that corresponds to your response.

	Almost Never	Rarely	Some- times	Often	Almost Always	Not Sure/ Don't Know
a. My child enjoys going to school.	1	2	3	4	5	6
b. My child talks to me about what s/he does in school.	1	2	3	4	5	6
c. My child likes to do schoolwork on computers.	1	2	3	4	5	6
d. My child likes to do schoolwork with video equipment.	1	2	3	4	5	6
e. My child talks to me about his/her schoolwork with computers and other technology.	1	2	3	4	5	6
f. I am satisfied with how much my child learns in school.	1	2	3	4	5	6

3. In which *three* academic subjects would you like to see your child improve the most? PROBE

- | | | |
|----------------------------------|-------------------|----------------------|
| a. _____ English language skills | e. _____ Science | i. _____ other _____ |
| b. _____ Spanish language skills | f. _____ Spelling | j. _____ other _____ |
| c. _____ Math | g. _____ Reading | k. _____ other _____ |
| d. _____ Social Studies | h. _____ Speaking | |

4. How satisfied are you with your child's progress in the following areas:

	Not at All	Very Little	Some	A Lot	A Great Deal	NA/ Don't Know
Reading	1	2	3	4	5	6
Math	1	2	3	4	5	6
Writing	1	2	3	4	5	6

Science	1	2	3	4	5	6
Social Studies	1	2	3	4	5	6
Peer Relationships	1	2	3	4	5	6
Self-Confidence	1	2	3	4	5	6
Cultural Sensitivity	1	2	3	4	5	6
Motivation for Learning	1	2	3	4	5	6

The following questions are intended to gather information about parents as a group. Remember, answers to the next questions as well as to all of the questions you have answered will be kept strictly confidential.

5. How long have you lived in this community? _____ years

6. What language(s) is (are) used primarily in your home?

☐ []	☐ []	☐ []	☐ []
Mostly English	Mostly Spanish	About the same amounts of English and Spanish	Other language(s) Please Specify: _____

7. What is the highest grade level in school that you have completed? _____

Where did you go to school? _____

8. What is your marital status?

☐ Married ☐ Divorced ☐ Widowed ☐ Separated ☐ Single

9. What is the employment status of the adults in your household?

(Count adult #1 as respondent)

Adult #1:	Employed P-T ☐ F-T ☐	Unemployed ☐	In school P-T ☐ F-T ☐
Adult #2:	Employed P-T ☐ F-T ☐	Unemployed ☐	In school P-T ☐ F-T ☐
Adult #3:	Employed P-T ☐ F-T ☐	Unemployed ☐	In school P-T ☐ F-T ☐
Adult #4:	Employed P-T ☐ F-T ☐	Unemployed ☐	In school P-T ☐ F-T ☐

10. Are there any additional comments or suggestions that you would like to make at this time?

THANK YOU!

Student Survey

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We are very interested in your thoughts and opinions of your school. Your ideas and suggestions are important. Please think about your school and answer the following questions based on your experiences. Thank you!

Please circle just one answer to each question:

1. Students get along well with teachers.	strongly agree	agree	disagree	strongly disagree
2. Students make friends with students of other racial and ethnic groups	strongly agree	agree	disagree	strongly disagree
3. Teachers are interested in students.	strongly agree	agree	disagree	strongly disagree
4. When I work hard, my teachers praise my efforts.	strongly agree	agree	disagree	strongly disagree
5. Most of my teachers really listen to what I have to say.	strongly agree	agree	disagree	strongly disagree
6. I am learning problem-solving skills and decision-making skills that I will be able to apply in my life outside of school.	strongly agree	agree	disagree	strongly disagree
7. There is good communication between students and teachers.	strongly agree	agree	disagree	strongly disagree
8. I have learned how to work and communicate within a group.	strongly agree	agree	disagree	strongly disagree
9. My friends from other schools would like to go to this school.	strongly agree	agree	disagree	strongly disagree
10. I feel that school is a place where I can accomplish many things.	strongly agree	agree	disagree	strongly disagree
11. Doing school work gives me good feelings about myself.	strongly agree	agree	disagree	strongly disagree

12. How much television do you usually watch at home on a school day?

- (a) None
- (b) 1 hour or less
- (c) 2 hours
- (d) 3 hours
- (e) 4 hours
- (f) 5 hours
- (g) 6 hours

13. How often do you read on your own for fun outside of school?

- (a) Almost every day
- (b) Once or twice a week
- (c) Once or twice a month
- (d) Never or hardly ever

14. How much time do you usually spend each day on homework for all school subjects?

- (a) I usually don't have homework
- (b) 1/2 hour or less
- (c) 1 hour
- (d) 2 hours
- (e) More than 2 hours

15. How much television do you usually watch at home on a school day?

- (a) Often
- (b) Sometimes
- (c) Never

16. How often do you watch your teacher do science experiments?

- (a) Often
- (b) Sometimes
- (c) Never

17. How often do you do science experiments by yourself or with other students in school?

- (a) Often
- (b) Sometimes
- (c) Never

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Student Reflection Part B

Student Name: _____

Student Number: _____

Please think about your experiences at your school this year and answer the following four questions. There are two questions on this side and two questions on the back side of this page.

Thank you!

- 1. Describe the things you like best about your school.**

- 2. Describe how your school is different from other schools you have attended.**

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Please turn your paper over...

3. What are the most important things you have learned at your school this year?

4. Describe some suggestions you have for making your school even better.

Please turn your paper over...

Co-NECT Assessment 1995

Student Reflection Part C

Student Name: _____

Student Number: _____

Think about the teachers and the kinds of things you do in your classrooms. Draw a picture of one of your teachers working in his or her classroom.

Progress Rubric

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Introduction

What are the Strategies To Improve Student Performance?

The Strategies To Improve Student Performance represent our "best bets" about what schools can do to enable all students to achieve high standards of performance.

The strategies are organized by design task, since each design task - standards and assessments; learning environments; community services and supports; high performance management; and public engagement - includes a unique set of strategies. Yet the five design tasks work together as an integrated whole.



Implementing strategies in all five design tasks will produce the desired results in high student performance

These strategies are not a ready-made blueprint. Schools need to examine their own culture and experience, and tailor strategies to their own needs and come up with their own strategies that will fit their circumstances. And they must continually determine if their strategies are producing the desired level of performance.

How can the Strategies To Improve Student Performance help my school?

The strategies can help schools move from traditional practices toward the Alliance Design, as shown in the chart below.

Design Task	Traditional Practice	Alliance Design
Standards and Assessment	- Standards vary - by student, by classroom, by school - Standards are implied, rather than explicit - Assessments measure only basic knowledge and skills - Assessments compare students' performance to that of other students, not to standards	- Districts adopt and schools use high, internationally benchmarked performance standards, indicating what students should know and be able to do in core subjects - Schools use performance assessments to measure student performance against high standards, and portfolios as classroom tools to organize instruction around standards
Learning Environments	- Classroom instruction is teacher-directed and textbook driven - Curriculum is organized to cover content, not to ensure student learning - Instruction seldom connects learning to the world outside of school - Technology is used for its own sake, rather than to support student learning	- Curriculum is organized around standards for performance - Schools regularly employ instructional units tied to standards - Technology is incorporated into the instructional program as a tool to enhance student learning - Applied learning competencies (skills for work-place) are incorporated into the academic program
Community Services and Supports	- Schools seldom address the health and well-being needs of students and families - Schools are unaware of many school and community resources for dealing with the needs of children and families, and do not form links to community agencies that provide such services	- Schools, families and community agencies collaborate to identify supports and services needed in order for all children to be able to achieve at high levels - Schools offer a range of supports for students and refer children and families to needed services
High Performance Management	- Districts issue rules for how schools will operate, and hold schools accountable for following rules - Schools have few resources at their own disposal and little control over budget, personnel and programs - In schools, principals direct every aspect of the school and seldom allow teachers to exercise their professional judgment	- Districts set goals for student performance, shift resources and authority to schools to allow them to determine how to meet goals, and hold schools accountable for results - School leaders are able to manage schools with authority over budget, personnel and programs and can meet the challenge of achieving results - Districts and schools align resources and programs to achieve student performance results - Schools define roles and responsibilities for staff members to achieve desired results and form teams to enable staff members to fulfill their responsibilities for achieving results
Public Engagement	- School communication to parents and the community is one-way - from the school - and addresses what the schools want to say, not necessarily what the community wants to know - Parental involvement depends on the number of parents who choose to come to the school	- Schools regularly listen to parents and the community to determine their goals and expectations for the schools, and incorporate those views in school plans - Schools employ a range of strategies for communication and enlisting support from parents and members of the community - Schools employ a variety of strategies for engaging parents as partners in the education of their children

In both cases, this strategies tool is a vital element in a school's planning process. Using this process, schools can ensure that they align their programs with results, and thus achieve the results they want - students' achieving high standards of performance.

For each Design Task . . .

For each Design Task . . .

Circle a 1,2 or 3 to determine the current level of implementation of each strategy in the school.

Circle a 1,2 or 3 to determine the desired level of implementation of each strategy.

Check off the strategies your school will implement during the year.

Customize strategies for your school if necessary.

Standards & Assessment

Strategies

	1 not implemented	2 somewhat implemented	3 fully implemented
Where is the school now?			
Where do we want the school to be?			
Which strategies will we implement?			

A

B

C

The key lets you know that the National Center considers this to be a key strategy for getting all students to high standards.

Once all the Design tasks have been filled in...

School Strategies



Strategies for the Academic Year: _____

Instructions

Use this sheet to document the strategies that your school has selected to work on during the academic year and to help you make sure that strategies from all five design tasks have been selected. Remember that it is critical to implement strategies across the five design tasks in order to have students achieve at high levels.

Write the letter for the selected strategies in each box.

Design Task 1: Standards and Assessments

CIM
Standards
Assessments

☐	☐	☐	☐	☐	☐	☐	☐
--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------

Design Task 2: Learning Environments

Document the strategies that the school has decided to work on during the academic year by writing down the letters for the strategies selected in all five design tasks.



School Strategies



Benefits/Costs Evaluation for All Selected Strategies

What are the benefits to be gained from implementing the selected strategies?

Reflect on the strategies that have been selected in all five design tasks by doing a Benefits/Cost evaluation.





Design Task 1: Standards and Assessment

1 not implemented	2 somewhat implemented	3 fully implemented
-------------------------	------------------------------	---------------------------

Strategies

Where is the school now?	Where do we want the school to be?	Which strategies will we implement?
--------------------------	------------------------------------	-------------------------------------

Certificate of Initial Mastery (CIM)

C)
|||

A.

Put in place a Certificate of Initial Mastery, and expect all but the most severely disabled students to attain a Certificate of Initial Mastery.

1	2	3	1	2	3
---	---	---	---	---	---

C)
|||

B.

Communicate to all students at all grade levels and to parents the expectations and requirements for attaining a Certificate of Initial Mastery.

1	2	3	1	2	3
---	---	---	---	---	---

C.

Use the standards embodied in a Certificate of Initial Mastery as the targets for students' performance, including interim performance targets for elementary and middle schools.

1	2	3	1	2	3
---	---	---	---	---	---

D.

Provide support to help students who are not achieving to meet a Certificate of Initial Mastery standard.

1	2	3	1	2	3
---	---	---	---	---	---

E.

Arrange with local colleges and universities to use a Certificate of Initial Mastery as a basis for admission.

1	2	3	1	2	3
---	---	---	---	---	---

F.

Provide opportunities for students who have earned a Certificate of Initial Mastery to take college level courses, to enter college or to take part in programs leading to professional and technical certification.

1	2	3	1	2	3
---	---	---	---	---	---

G.

Arrange with local businesses to use a Certificate of Initial Mastery as a way of awarding preference in hiring decisions.

1	2	3	1	2	3
---	---	---	---	---	---

Design Task 1:
Standards and Assessment



Strategies

1 not implemented	2 somewhat implemented	3 fully implemented
-------------------------	------------------------------	---------------------------

Where is the school now?	Where do we want the school to be?	Which strate- gies will we implement?
-----------------------------	--	---

Standards

H.

Adopt and act consistent with the belief that all but the most severely disabled can and must reach internationally benchmarked standards of achievement.

1	2	3	1	2	3
---	---	---	---	---	---

I.

Link, in a consistent way, the school's performance standards to performance standards used in schools at lower and higher grade levels to reach a Certificate of Initial Mastery.

1	2	3	1	2	3
---	---	---	---	---	---

J.

Adopt the New Standards Performance Standards or the local standards that are linked to the New Standards Performance Standards.

1	2	3	1	2	3
---	---	---	---	---	---

K.

Use local, state or nationally developed performance standards in core content areas not addressed by the New Standards performance standards.

1	2	3	1	2	3
---	---	---	---	---	---

L.

Train staff to be knowledgeable about and use the New Standards Performance Standards, and/or the local, state or nationally developed Performance Standards (that are linked to the New Standards Performance Standards).

1	2	3	1	2	3
---	---	---	---	---	---

M.

Establish annual performance targets tied to the student performance standards.

1	2	3	1	2	3
---	---	---	---	---	---



Design Task 1:
Standards and Assessment

		1 not implemented	2 somewhat implemented	3 fully implemented
Strategies		Where is the school now?	Where do we want the school to be?	Which strate- gies will we implement?
Assessments				
C) =	N. Administer the New Standards Reference Examinations or administer locally developed assessments linked to those of New Standards.	1 2 3	1 2 3	
C) =	O. Use local, state or national assessments linked to standards to assess student performance in subjects that are not covered by the New Standards assessments.	1 2 3	1 2 3	
	P. Use results from the New Standards Reference Examinations, or from locally developed assessments linked to those of New Standards, to establish performance targets.	1 2 3	1 2 3	
	Q. Use student results from local, state or national assessments to establish standards-based performance targets in the subject areas not covered by the New Standards assessments.	1 2 3	1 2 3	
	R. Use assessment data on a regular basis for curriculum planning and for allocation of resources.	1 2 3	1 2 3	
Customized Strategies for Design Task 1				
		1 2 3	1 2 3	



Design Task 1:
Standards and Assessment

Strategies

1 not implemented	2 somewhat implemented	3 fully implemented
-------------------------	------------------------------	---------------------------

Where is the school now?	Where do we want the school to be?	Which strate- gies will we implement?
-----------------------------	--	---

Customized Strategies for Design Task 1

1	2	3	1	2	3
---	---	---	---	---	---

1	2	3	1	2	3
---	---	---	---	---	---

1	2	3	1	2	3
---	---	---	---	---	---

BEST COPY AVAILABLE



Design Task 2: Learning Environments

1 not implemented	2 somewhat implemented	3 fully implemented
-------------------------	------------------------------	---------------------------

Strategies

Where is the school now?	Where do we want the school to be?	Which strate- gies will we implement?
-----------------------------	--	---

Curriculum

A.

Structure the curriculum to prepare all students to meet the performance standards as measured by the New Standards Reference Exams and the Certificate of Initial Mastery.

1	2	3	1	2	3
---	---	---	---	---	---

B.

Organize curriculum around major concepts across all grade levels, increasing the complexity of the content and focusing on getting all students to standards.

1	2	3	1	2	3
---	---	---	---	---	---

C.

Integrate applied learning performance standards with academic performance standards in the curriculum.

1	2	3	1	2	3
---	---	---	---	---	---

D.

Link the standards and curriculum used in high schools with those of post secondary educational institutions.

1	2	3	1	2	3
---	---	---	---	---	---

Instruction

E.

Implement standards-driven instruction in the classroom.

1	2	3	1	2	3
---	---	---	---	---	---

F.

Organize instruction so that students meet standards by demonstrating a deep understanding of the core subjects and the capacity to apply that understanding to complex, real-world problems.

1	2	3	1	2	3
---	---	---	---	---	---

G.

Train teachers on standards-driven instruction so that they are able to create standards-driven units of study and integrate the standards into the curriculum.

1	2	3	1	2	3
---	---	---	---	---	---

H.

Implement a portfolio system to organize instruction around the standards.

1	2	3	1	2	3
---	---	---	---	---	---



Design Task 2: Learning Environments

1 not implemented	2 somewhat implemented	3 fully implemen
-------------------------	------------------------------	------------------------

Strategies

Where is the school now?	Where do we want the school to be?	Which strat- gies will we implement?
-----------------------------	--	--

I.

Structure instruction so that all students will be able to explain the scores on their projects and performances in terms of the standards and the performance criteria for meeting the standards.

1	2	3	1	2	3
---	---	---	---	---	---

J.

Display student work with clear assessment criteria linked to standards such as rubrics that demonstrate why the work meets the standards.

1	2	3	1	2	3
---	---	---	---	---	---

K.

Employ a variety of instructional strategies that provide students with opportunities to produce work that meets the standards.

1	2	3	1	2	3
---	---	---	---	---	---

L.

Organize teachers' and schools' record-keeping systems around the standards so that they indicate students' progress toward meeting the standards, and identify when they have met the standards.

1	2	3	1	2	3
---	---	---	---	---	---

Technology

C)

M.

Develop and implement an ongoing technology plan that supports all students' reaching high standards.

1	2	3	1	2	3
---	---	---	---	---	---

C)

N.

Provide professional time for school staff to develop their skills of using information technologies in their instruction to help students reach high standards.

1	2	3	1	2	3
---	---	---	---	---	---

O.

Network most of the computers in the school in order to integrate the instructional and administrative computer systems of the school, the district and the state and provides local, global and remote E-mail / file sharing /Internet access.

1	2	3	1	2	3
---	---	---	---	---	---

P.

Implement a system for institutionalizing the ongoing sharing of new information on technologies and of technology skills among staff, including a process for evaluating the appropriateness of specific software programs for use in instruction.

1	2	3	1	2	3
---	---	---	---	---	---



Design Task 2: Learning Environments

1 not implemented	2 somewhat implemented	3 fully implemented
-------------------------	------------------------------	---------------------------

Strategies

Where is the school now?	Where do we want the school to be?	Which strate- gies will we implement?
-----------------------------	--	---

Q.

Provide on-going assistance to staff on using technology to support the instructional and administrative goals of the school.

1	2	3	1	2	3
---	---	---	---	---	---

R.

Provide on-going maintenance of all computer technology in the school in a timely manner.

1	2	3	1	2	3
---	---	---	---	---	---

School-to-Work

C)

S.

Develop and implement units of study that integrate applied learning competencies and academic competencies and that incorporate key structural and cultural features of workplaces.

1	2	3	1	2	3
---	---	---	---	---	---

C)

T.

Coordinate and integrate community-based workplace learning with school-based learning.

1	2	3	1	2	3
---	---	---	---	---	---

U.

Provide opportunities for adults and business partners from the community to help students plan and work on their units of study and share in the process of judging student work.

1	2	3	1	2	3
---	---	---	---	---	---

V.

Provide job-shadowing, voluntary internships (service learning), mentorships and/or youth apprenticeship-style work experience for all middle and high school students.

1	2	3	1	2	3
---	---	---	---	---	---

W.

Provide opportunities for educational staff to work with business partners in internships, job-shadowing and curriculum development.

1	2	3	1	2	3
---	---	---	---	---	---

X.

Implement programs, for students who have earned a Certificate of Initial Mastery, that allows them to go to college (in high school or after high school), begin occupational, technical or professional certificate programs, go to work or be involved in a full-time community service experience, or be involved in a combination of these programs.

1	2	3	1	2	3
---	---	---	---	---	---

1	2	3
not	somewhat	fully
implemented	implemented	implemented

Where do we want the school to be?

Which strategies will we implement?

Customized Strategies for Design Task 2

1

Implementation Observables Checklist

From *Charting School Progress of New American Schools: Creating a School Reform Portfolio*, Karen Mitchell, RAND, Santa Monica, DRU-1043-NASDC, 1995

IMPLEMENTATION OBSERVABLES CHECKLIST

Standards and Assessment

- Standards statements.
- Schedule of training and materials given to teachers to help them understand new standards.
- List of names of members of local standards committees and example minutes of meetings copies of materials given to students, parents, and/or community members explaining new standards.
- Available documentation on the links between standards and curriculum, and standards and assessments.
- Schedule of training and materials given to teachers to do portfolio assessments and other new assessments.
- Samples of portfolios assessments.
- Samples of alternative assessment tasks not part of portfolios.
- Statements of examples of scoring criteria for portfolios and non-portfolio assessments.
- Documentation of changes in student achievement.
- Documentation on the links between curriculum and assessments.

Curriculum and Instruction

- Examples of lesson plans, units of study, etc.
- Number of lesson plans or units of study developed versus number remaining to be completed to cover full curriculum by grade level.
- Sequence across grades of new curriculum (schedule for a student).
- Other changes to courses, course content, and course sequencing.
- Documentation of connections to community in curriculum areas.
- Description of quality control mechanisms in place for newly developed curriculum. For example, teacher peer review, review by design team, etc. And, evidence of subsequent changes or

dropped units (for example, five units dropped after peer review).

- Schedule of training and materials for teachers for new curriculum.
- Schedule for completion of all required curriculum units.
- Schedule for adoption of instructional strategies.
- Schedule and materials provided teachers for new instructional strategies.
- List of places teachers use for community as classroom.
- List of when the community has come into the classroom--speakers, performers.
- Example of schedule that allows for students' individual choices.

Teacher Professional Development

- Schedule of teacher professional development meetings.
- Workshop materials.
- Workshop attendees roster.
- School visit agendas.
- Documentation of ongoing teacher collaboration.

Technology Use

- List and location of newly purchased, design-related equipment (classroom, labs, principal's office).
- Schedule for purchasing more design related equipment.
- Schedule and materials for training.
- List of software programs/packages used.
- Examples of curriculum units incorporating technology.

School Organization and Governance

- List of names of members of various committees required by design.
- Schedule and materials for training in new governance roles.
- Schedule of committee meetings and examples of minutes from meetings.

- Significant products of the committees, such as new schedules for courses, standards for exemplary student products, new standards, plans for technology, school improvement plans.
- Newly developed rules, regulations, master contracts, site-based management plans, waivers, and district-school agreements about school level control over budget, hiring, firing, evaluation, or mission.
- Teachers' school day schedule demonstrating time for teaming, curriculum writing, paperwork, etc.
- List of incentives to encourage new behaviors.
- Documentation of new/changed staffing patterns including master teachers, apprentices, aides, volunteers, facilitators.
- Master contract changes to accommodate these roles.
- Grievances filed concerning new roles.
- Hiring/layoffs due to design implementation.
- Description of new roles for administrators.
- List of new grade combinations, teacher team combinations, etc., and when they went into effect.
- Relative number of classes covered by these new combinations versus classes that have not converted.
- Description of student placement procedures.

Family and Community Services

- Name of social services coordinator for school.
- Schedule for different activities.
- Indicators of utilization of or participation in these services.

Public Engagement

- Schedule of public meetings.
- Materials explaining reform program for parent and community audiences.
- Materials explaining reform for education stakeholder audiences.

- Samples of newspaper articles and newsletters for lay consumption.
- Community volunteer roster.
- Business/nonprofit participation agreements.

School/System/Project Partnering

- Statements of partnership objectives.
- Schedules for and minutes from partner meetings.
- Products jointly developed by partners.

School Outcomes Checklist

From *Charting School Progress of New American Schools: Creating a School Reform Portfolio*, Karen Mitchell, RAND, Santa Monica, DRU-1043-NASDC, 1995

School Outcomes

Student Performance Indicators

- Attendance rates
- Homework completion rates
- Special education referrals and placements
- Promotion rates
- Graduation rates
- Rates of disciplinary referral, suspension and expulsion
- Drop-out rates
- Tardiness levels
- Numbers of students with one or more failing grades
- Numbers of students performing at or above grade level in language arts and/or math
- Test score information or other performance assessment standings
- Average high school course loads taken
- Numbers of students taking the SAT or ACT Assessment
- Numbers of scholarships/honors awarded to seniors and other students
- Rates of participation in school activities/organizations
- Technical school enrollment or entry into military service
- College placement rates, major selection and non-remedial college course enrollment
- Technical school and college advanced course completion rates
- Technical school and college program completion rates
- Entry-level job placement and job performance levels
- Number of students on waiting list for program or school

Program Outcome Indicators

- Instructional staff absence rates
 - Retention of teachers in the school/project
 - Numbers of applicants for open teaching positions
 - Average teaching experience and degree status of newly-hired teachers
 - Parent/teacher conference participation rates
 - PTA and other parent meeting participation rates

 - Parent volunteer rates
 - Campus substance abuse, violence, and criminal activity rates
 - Numbers and outcomes of fundraising efforts by parents and community members
-

Context Data Worksheet

From *Charting School Progress of New American Schools: Creating a School Reform Portfolio*, Karen Mitchell, RAND, Santa Monica, DRU-1043-NASDC, 1995]

CONTEXT DATA WORKSHEET

Student Population

		1995/96	1996/97	1997/98	1998/99
ENROLLMENT					
GENDER	Male				
	Female				
RACIAL/ETHNIC STATUS	American Indian/Alaskan Native				
	Asian/Pacific Islander				
	African American				
	White (not of Hispanic origin)				
	Hispanic				
	Other				
LIMITED ENGLISH PROFICIENT					
FREE/REDUCED PRICE MEALS					
CHAPTER 1					
SPECIAL EDUCATION					
GIFTED/TALENTED					
MOBILITY					
STANDARDIZED TEST DATA (describe battery, form, score scale)	Grade _____				
	Grade _____				
	Grade _____				

School Characteristics

		1995/96	1996/97	1997/98	1998/99
STAFFING LEVELS	Instructional Staff				
	Administrative Staff				
INSTRUCTIONAL TIME					
BUDGET INFORMATION	Federal Moneys				
	District Funds				
	Grant and Contract Funds				
	PTA and Other Fundraising Moneys				
	Other Funds				

Example Definitions for Context Data:

1. Enrollment--Number of students enrolled on 9/30.

2. Student population characteristics--Number and percent of students (on 9/30 or average daily during the official school year) disaggregated by gender, race, LEP, free/reduced price meals, Chapter 1, special education, and G&T; where applicable, the following definitions may be used for disaggregation:

Gender--male/female

Race--American Indian/Alaskan Native, Asian/Pacific Islander, African American, White (not of Hispanic origin), Hispanic, other (census categories)

Limited English proficient--have primary or home language other than standard English and have limited or no age-appropriate ability to understand, speak, read or write English

Free/reduced price meals--meet family size and income guidelines (US Department of Agriculture) for free/reduced price meals

Chapter 1--receive services funded in whole or part by Chapter 1, ESEA

Special education--students with learning or physical disabilities who have current Individualized Education Programs and are served by the system

Gifted and talented--are identified as academically gifted and/or talented and receive services/programs funded by the system

3. Mobility--number and percent (of enrollment) of students (1) entering the school after 9/30, and (2) transferring or dropping out after 9/30 and before 6/1.

4. Norm- or criterion-referenced test data (if available from an ongoing program)--summaries of standardized test data reported as percentiles, stanines, normal curve equivalents, grade equivalents, or standard- or scale-based scores (include descriptions of scale or rubric definitions)

5. Staffing levels--number and percent (of enrollment) of instructional staff (staff who perform professional activities related to teaching students) and professional support staff (staff who provide auxiliary services for students or the program, including librarians, counselors, principals, administrative assistants, etc.).

6. Instructional time--average total time per day spent on instructional activities and days of instruction per year.

7. Budget information--funds from the district (per pupil expenditures and other district-provided moneys), Chapter 1, Chapter 2, Goals 2000, grant, and other funds, PTA and other fund-raising moneys.

Comprehensive Outcomes Worksheet

From *Charting School Progress of New American Schools: Creating a School Reform Portfolio*, Karen Mitchell, RAND, Santa Monica, DRU-1043-NASDC, 1995

COMPREHENSIVE OUTCOMES WORKSHEET

Student Population

		1995/96	1996/97	1997/98	1998/99
ATTENDANCE RATES					
PROMOTION RATES					
GRADUATION RATES					
DROP-OUT RATES					
DISCIPLINARY REFERRALS/SUSPENSIONS/EXPULSIONS					
PERFORMANCE ASSESSMENT DATA (describe assessment, rubrics, scale)	Grade ----				
	Grade ----				
	Grade ----				

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School Characteristics

		1995/96	1996/97	1997/98	1998/99
TEACHER ATTENDANCE RATES					
TEACHER RETENTION RATES					
PARENT/TEACHER CONFERENCE PARTICIPATION RATES					
PARENT VOLUNTEER RATES					
FAMILY/COMMUNITY SERVICE RATES					
COMMUNITY VOLUNTEER RATES					
BUSINESS/NONPROFIT PARTICIPATION					

Example Definitions for Comprehensive Outcome Data:

1. Attendance rates--percent of students present on an average school day from 9/30 through 6/1 (or during the official school year).
2. Promotion rates--percent of students advanced to a higher grade or instructional level at the conclusion of the school year.
3. Graduation rates--number and percent of students completing minimum requirements for a high school diploma.
4. Drop-out rates (for middle and high schools)--number and percent of high school students withdrawing from high school (without transferring into another academic program) between 9/30 and 6/1 (or prior to completion of the high school program); readmitted students dropping out on a second or subsequent occasion should be counted once.
5. Disciplinary referrals/suspensions/expulsions--number and percent of students suspended, expelled or officially referred (beyond the classroom level) for disciplinary action.
6. Performance assessment data (if available from an ongoing program)--summary information from performance-based assessments, including numbers and percents of students scoring at each standard or scale level, copies of the standard or scale descriptions/rubrics, and sample student work.
7. Teacher attendance rates--number and percent of instructional staff present in school or in an approved teacher professional development session on an average school day during the official school year.
8. Teacher retention (in the school) rates--number and percent of instructional staff retained in the school from each of (1) the beginning to end of the official school year and (2) one academic year to the next.
9. Parent/teacher conference participation rates--percent of students for whom a parent or guardian attended official conferences.
10. Parent volunteer rates--numbers of parents (and percents of families) volunteering and participating in the instructional program, in administrative support of the program, in fundraising activities, and in extracurricular activities.
11. Family and community service utilization rates--by service category and overall, the numbers of (1) school families and (2) community members using social and health support services provided by the program.
12. Community member volunteer rates--numbers of community members (not school families) volunteering in the instructional program, in administrative support of the program, in fundraising activities, and in extracurricular activities.
13. Numbers of businesses/nonprofits participating in the program--numbers of businesses partnering with or participating in the school in support of the instructional program and in administrative and financial support.

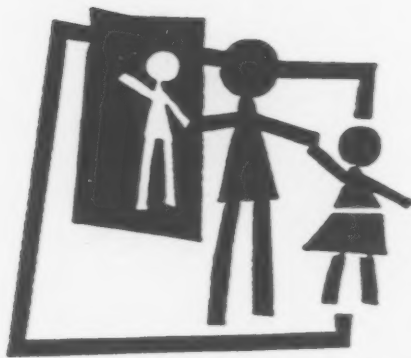
Appendix E

EXAMPLE PROGRESS PORTFOLIO

Excerpted from (1) *Designing New American Schools: The Co-NECT Experience*, August 1995 and December 1995 (Morrison, Goldberg, and Kirkpatrick); and (2) *Design for a New Generation of American Schools, Phase 2/Year 2*, July 1995, Bolt, Beranek, and Newman, Inc.

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Co-NECT School Progress Portfolio



Fall 1993 - Spring 1995

PREFACE

The Co-NECT "school design" was developed by a group within the Educational Technologies Department at Bolt Beranek and Newman Inc. (BBN), with start-up funding from the New American Schools Development Corporation (NASDC).¹ Testing and refinement of the design has taken place over a three-year period, from 1992-1995, primarily at three sites:

- Site A, a Co-NECT School since 1992, was the first to "implement" the design fully. It is currently a K-9 school, operating on two separate campuses in a city in Massachusetts. By 1997, it is scheduled to become a full K-12 school operating in a single new building.
- Site B, a middle school in a small city in Alaska, has been working with the design since 1994--a school-within-a-school at the local high school has also been using the Co-NECT design.
- Site C, a middle school in a working-class Indiana suburb has been working with the Co-NECT design since January 1995, in a "school-within-a-school" setting.

As of November 1995, we have begun to work with 12 additional schools in Dade County (Florida), Memphis (Tennessee), and Cincinnati (Ohio). This report documents the change process that has taken place (and continues) at our initial three sites, and the results that have been achieved through the hard work of our school partners.

WHAT IS A "SCHOOL DESIGN"?

The term "school design" dates back as far as the original request for proposals issued by NASDC, which sought to fund a number of "design teams" to: (1) "create and test designs for schools that achieve

¹NASDC was founded in 1991 by corporate leaders who worked to help reform the nation's public schools. NASDC has been providing support to design teams working in 147 schools in 18 states.

national education goals..." and (2) "assist communities... to adopt and create the designs for their own purposes." These "break-the-mold" designs would integrate all elements of life in a school, and would be "benchmarked" against "demanding goals and achievement standards," and would provide "dramatically better outcomes" for all students.

The design team formed by BBN has taken these mandates seriously. Drawing on what we see as the best available research and practitioner experience, we have developed a framework, called the Co-NECT School Design,² consisting of twenty-six distinct design elements in five categories: school-based design; performance assessment; project-based learning; professional community; and use of technology. Most schools will have already implemented at least some of these components to some degree. For example, many schools around the country have mission statements (Design Element 1.1), but the mission statement is not always a "living" document that serves to guide the daily activities of the entire school community. Many schools have one or two computers with dial-up Internet access, but few have direct access for all computers in the school (Element 5.3).

We see our own mission as helping participating schools employ the full Co-NECT design framework (and thus become a "Co-NECT School") in a way that best meets local needs and makes the best use of local resources. Working with a school-based design team (Element 1.2), we help each school identify the features it has already implemented, and where further work is required. We then help the school develop an action plan aimed at implementing all twenty-six of the design elements as quickly and fully as possible. At the same time, we work with a school evaluation team (Element 2.6) (which may be part of the design team) to monitor the progress of implementation and track results.

Stated in these terms, the process of "designing a school," or "implementing" a "school design" may seem straightforward--and simplistically so. In fact, we are acutely aware that the process of designing or redesigning a school as an organization bears little resemblance to the sort of engineering process the term "design" may

²Co-NECT stands for "Cooperative Networked Educational Community for Tomorrow."

call to mind. While it is easy enough to speak importantly about "implementation," "benchmarking," "needs analysis," "action plans," and so on (and we do speak of these things) in working with the real people at our sites (principals, parents, teachers, students, etc.), with all their varied experiences, deeply-held beliefs, work habits, time constraints, fears, and cherished personal agendas, we have long ago come to realize that designing a school is more like raising a family or starting a new business than it is like designing a new car or industrial process--the results are far from guaranteed. An automobile that is capable of accelerating from 0 to 60 mph in 5 seconds will do that for any driver because that is what it is designed to do. But even the "best" school design will produce mediocre results without the hard work of the people who really matter--principals and parents, teachers and students, concerned community members, and school district officials. It follows that when a particular design is associated with improved results (as is the case with Co-NECT), the design can at best be credited with enabling these results, not "producing" them.

Therefore, as we discuss the "implementation" of the design at our sites, it should be understood that we are not dealing with a single, easily specified intervention that might be compared in any meaningful way with other such interventions--in the way that it might be possible, for example, to compare different methods of heart bypass surgery or different brands of dishwasher. Simply put, the interactions between the "design" and the unique characteristics of each school community (the intervening variables) make it impossible to establish any causal relationships between implementation of the design as a "thing" and the many outcomes that will follow. At best, we can tell rich stories about the change process as it has occurred at particular sites.

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³This reform portfolio reflects the observations of Co-NECT reformers; it describes program implementation levels and early outcomes during the period from fall 1993 through spring 1995. The portfolio periodically will be updated to provide a longitudinal account of school progress in relation to design goals and features. Please call or write XXX to inquire about future reports.

1. INTRODUCTION TO THE CO-NECT SCHOOL DESIGN AND MAJOR GOALS

The Co-NECT design is based on our understanding of the best reform practices in this country and abroad. It calls for schools to be organized around small multiage clusters of students taught by a cross-disciplinary teaching team. It is expected that students will stay in the same cluster, with the same teachers, for at least two years. Working within national, state, and district frameworks, teachers develop performance standards defining what students should know and be able to do. The curriculum focus is on authentic, interdisciplinary projects that give every student an opportunity to acquire critical skills and deep content understanding, as defined by the school's performance standards. At the high school level, projects focus on school-to-work transition.

Faculty representatives of each cluster serve on a school design team. Led by the building principal, with input from parents and other members of the community, the team sets overall goals and monitors results. A sophisticated communications infrastructure, featuring direct Internet connectivity, gives everyone in the school community access to the technology of the 21st century workplace and is fully integrated with teaching and learning.

The design is intended to help those who work with it achieve the following outcomes.

- For communities, the attempt to build a system that makes more effective and entrepreneurial use of local resources, and that is increasingly responsive to the academic, social, and career needs of children, parents, and the community as a whole.
- For teachers, potential results include increased involvement in professional activities, teamwork skills, technology expertise, and an expanded repertoire of teaching strategies.
- For students, outcomes may include deep understanding of selected topics in core subject areas along with critical skills for the workplace, citizenship, and lifelong learning.

SCHOOL-BASED DESIGN

Co-NECT is founded on the notion that the effort to transform schools must be an ongoing, local process, engaging the passions, ideas, and talents of those who are most closely invested in the quality of education each school provides. The desire for change (and the energy to make change happen)--must fuel a grassroots movement, supported and facilitated by parents, local business, district officials, teachers, principals and other influential segments of the community, and carried out by an empowered, accountable professional staff.

As a mechanism for helping the school community articulate a vision, then translate that vision into concrete action, Co-NECT advocates the creation of a "school design team." Using Co-NECT as a general framework, the design team develops an action plan for whole-school restructuring. Part of this action plan will be a strategy for developing multiple, "two-way" relationships between the school and other organizations and institutions in the surrounding community.

Finally, the design calls for an emphasis on empowering leadership, with responsibility and accountability for achieving the school's vision distributed through every level of the school community, from the district, down through the principals, to the youngest kindergartner.

PERFORMANCE ASSESSMENT

The Co-NECT design stipulates that assessment and evaluation should be ongoing, systemic, and focused on continuous improvement in the quality of teaching and learning for everyone. Assessment and evaluation is "standards-driven," in the sense that there is a clear understanding of what is expected of teachers, students, and the school itself.

The primary means of measuring student performance is a set of "performance standards," specifying what every student, from elementary school through high school, is expected to accomplish before moving on to the next level. Performance standards are not just lists of what students should know (e.g., the causes of the Civil War, the place of Earth in the solar system), nor are they the sort of vaguely stated behavioral objectives that are sometimes associated with the phrase,

"Outcome-Based Education." Rather, performance standards in a Co-NECT school tend to be descriptions of concrete products that students are responsible for producing in conjunction with a significant project. For example, elementary school standards might require that students prepare an annotated list of books they have read, perform and report on a simple scientific experiment of their own choosing, compose a biography of a family member, and so on. At middle school and high school levels, performance standards become more challenging and more academically rigorous. Co-NECT provides a set of sample performance standards that local schools may use to develop standards that are consistent with their own state and district frameworks.

Along with performance standards, the faculty prepares a set of guidelines for evaluating student work called scoring rubrics. These rubrics, along with models of exemplary work, are aimed at helping students and parents understand exactly what is expected. Students keep their work in portfolios, which, along with teacher and student comments, become a record of the student's accomplishments and growing mastery of the school's performance standards.

In addition, Co-NECT schools are encouraged and helped to monitor results on a continuing basis, using a variety of different measures, including test scores, attendance data, records of disciplinary incidents, levels of parent involvement, and other key school performance indicators. For this purpose, it is recommended that participating schools form their own "evaluation teams." These teams have primary responsibility for monitoring results and reporting to the community.

The teams are supported by Co-NECT Critical Friends, a program begun in 1994-1995. Teams of teachers and staff at Co-NECT schools visit each other periodically to get to know each other's schools, and take a critical look at the process and progress of restructuring. The stated purpose is to give the Co-NECT community as a whole "an opportunity to support each member school in its efforts to dramatically improve the quality of teaching and learning."

Critical Friends teams attend classes, interview the principal and other members of the school design team, "shadow" students, study

samples of student work, and speak with parents and other members of the community. At the end of their visit, the team presents a confidential consensus report to the school, identifying both *strengths* and *challenges*. The team does not attempt to suggest detailed solutions to perceived problems. It is up to the school itself to develop ways to address issues the team identifies.

Along with the school's own evaluations, student test scores, and other sources of information, these reports fuel the school's ongoing process of self-assessment, benchmarking, and planning. At the school's discretion, other Co-NECT schools may also share the report, or portions of it.

PROJECT-BASED LEARNING

As a pedagogical concept, the term "project" seems to be firmly rooted in the parlance, if not the practice, of most teachers. When first introduced to the Co-NECT design, teachers frequently react positively to the project-based learning component. "Oh, we're already doing projects" is a typical response.

In fact, our notion of what constitutes a "real project" differs in significant ways from the kinds of curriculum projects that many teachers are used to organizing. More often than not, projects are seen as: (a) supplemental (not a core curriculum activity); (b) focused on "making things" (e.g. posters); (c) focused on representing information gleaned from a textbook or other such source; and (d) having limited audiences (e.g., the teacher, other students, parents).

For example, in a school project of the most typical sort, a student or group of students might be asked to prepare a computer presentation on poisonous snakes, to supplement a unit the teacher is presenting on reptiles. Students spend a few class periods gathering the information from the library and typing it into the computer, perhaps verbatim. They also scan images from the books and add these to the presentation, which is shown to parents on parent night.

Compare this to a project on poisonous snakes that begins with the question, "Are poisonous snakes harmful or helpful?" As a way of answering this question, students may be asked to conduct library

research, but also to interview local farmers, wildlife officials, emergency room personnel, and attempt population counts of poisonous snakes in the area, and get access to snakebite data. The results of this research are presented as part of a temporary exhibit in a local science museum. An associated report becomes part of each participating student's portfolio.

The differences between these two kinds of projects are subtle but significant to our vision of how learning takes place in a Co-NECT school. The first involves a simple re-presentation of "facts;" the second is driven by a question to which there is no simple answer, and thus requires analysis of information and careful thought, not just regurgitation. In the first, the school walls circumscribe the audience and resources, which tends to limit the scope of the project and lessen expectations for quality; the second gets students out into the community, expands the scope of information, and raises the importance of quality. The first is focused on the product itself (the computer presentation); the goal of the second is understanding of a complex problem, and conveying the understanding to others.

PROFESSIONAL COMMUNITY

The driving force behind every successful school is a professional community of teachers and administrators who have the capacity and authority to chart their own course, manage their own learning, and help make the crucial decisions that affect the quality of education they provide the children and young adults in their charge.

With guidance and support from the principal, teachers work together in self-directed, interdisciplinary teams. Teams are encouraged to manage their own learning, continually reflect on their teaching practice, carefully monitor results, and share insights and successful new strategies with colleagues near and far. To be successful, these teaching teams need common planning time, access to resources (including technology), true decision-making responsibility, and effective, empowering leadership.

BEST AVAILABLE TECHNOLOGY

The Co-NECT Design calls for schools to make appropriate use of the best available technologies, providing access to computer tools, software, and video facilities for students and staff, and creating an open communications system that connects the school to the community and the world beyond. In this way the school's technology infrastructure supports the core activities of the learning community, enhancing teaching and learning, supporting the growth of the professional community, and strengthening ties between the school and its partner organizations.

Ideally, computers are distributed throughout the school (not concentrated in separate "laboratories") and every computer has desktop access to the Internet. Every member of the school community has an email account, and access to useful software tools. Responsibility for managing the school's information infrastructure is distributed among several people. As a result, we begin to see the emergence of what Co-NECT design documents refer to as a "technology culture." Among other things, this means that (1) all members of the school community are becoming expert at different uses of technology; (2) there is an established culture of knowledge sharing--"everyone is a teacher, everyone a learner;" and (3) as a group, the school community is becoming sophisticated about both the potentials and limitations of different technologies.

Finally, and perhaps most importantly, we expect to see appropriate use of technology throughout the curriculum, in all aspects of teaching and learning.

2. DESCRIPTION OF THE CO-NECT SITES

SITE A

Site A is a public school in the northeast that prides itself on being the first school in the nation to test and refine the Co-NECT design. Largely through the work of the school's principal and her faculty, the Co-NECT has become something more than a paper document.

School A is in an urban center with a population of 190,000. The district serves these residents through 42 elementary schools, 5 middle schools, and 4 high schools. In 1994-1995, 440 students attended the school, of whom 52 percent were classified as white, 32 percent Latino, 10 percent black and 6 percent Asian.

Two years prior to becoming a Co-NECT school in 1992, school A was a K-6 school that had been made a magnet for the city. The magnet plan was developed because the school had a much larger minority population than the district as a whole and it was hoped that the school could attract students from other areas of the city to bring the school into better racial balance. To do this the district brought in a new principal, who developed a planning document designed to attract a broad range of students. The plan was similar in flavor to the Co-NECT design, though less radical.

In becoming a Co-NECT School the school expanded to grades 7 and 8, with plans to add a grade each year after that. Because there was not enough room in the original building for additional students, a building was acquired on the other side of the city. The building itself caused numerous problems at the outset. Originally designed as a nursing home, it lacked facilities and equipment (such as wiring and a library) that were necessary for the proper functioning of a Co-NECT school. Partly as a result of this, implementation of the Co-NECT technology design was delayed at the outset.

While the school has a high student mobility rate, those students who stay at the school are active in and outside the classroom. Only 39 percent of the students who were enrolled at the beginning of the

1993-94 school year were still enrolled at the end of that year, but on the average, almost 92 percent of the students attended school daily. Only a small proportion of these pupils, 10 percent, were referred for some kind of disciplinary action. Less than 10 percent were receiving special education, and these students were included in the regular classrooms.

Due to its recent restructuring, the school had a new faculty who have shown much interest in integrating technology into their classrooms. Of the 46 member teaching staff at the school (which include teacher aides) 43 have obtained a B.A. or higher; 13 have an M.A. or higher degree. None of the teaching staff has taught in the school for more than three years, but several have engaged in non-required professional activities.

At the time the Co-NECT design was first implemented, a new superintendent and assistant superintendent were appointed. Both have been supportive of the implementation, but are concerned that all schools in the district be treated equally. They have stressed to the school the importance of mathematics and have encouraged the school to try to raise its scores on the state-mandated tests.

SITE B

As the 1994-1995 school year began, a middle school and high school program, both located in the far north, began implementing the Co-NECT design in their schools for the first time. A small city serving as the state capitol, it has a population of nearly 28,000 residents. The district operates eight Site Buildings, serving just over 5,400 students. These include five elementary schools serving over 2,600 students, two middle schools serving a little under 1,300, and a high school with nearly 1,500 students. In 1994-1995, the district's racial composition was 71 percent white, 19.3 percent Native Alaskan, 5.3 percent Asian, 2.3 percent Latino and 2 percent black. The budget totaled a little more than \$35.5 million, with per pupil expenditure averaging about \$6,500.

The recent history of educational reform in the district may be traced back to May 1981 when the Site Board called for the adoption of a

new "middle school" philosophy for local schools, combining grades 6-8. The new middle school community adopted several ideas that have since become popular in the reform movement. One of these ideas included interdisciplinary teaching and learning, with two to five teachers sharing the same students and similar schedules. The district allotted these teacher teams common planning time periods to discuss students and collaborate on teaching techniques. Other ideas include a flexible block schedule and multi-age grouping.

In addition to increasing change at the district level, the middle school was experiencing change as well. The district had decided to make considerable investments in new technology for education through a bond grant program and had targeted the school as a benefactor of these plans. As part of this investment, the school would relocate to a brand new facility at the start of the 1994-1995 academic year.

In the first year at the new site, the middle school had a population of 530 students with 65 percent white and 35 percent minority (26 percent Alaska Native, 5 percent Asian, 2 percent black and 2 percent Hispanic). Many of the students fell under the at-risk category. Students in the school come from varied backgrounds and socio-economic classes.

The school had already undertaken several restructuring initiatives prior to becoming a Co-NECT school. One of the most important of these was to create three separate "houses" within the middle school, each functioning as a smaller school community, with the idea of better addressing students' individual needs and interests. Students remain in their houses for all three of their middle school years.

Teachers formed these houses themselves, and tended to join with teachers with similar experiences and educational philosophies. Faculty who teach special subjects called "exploratories" (e.g., art, music, home economics, etc.) comprised a fourth house, serving the students in the other three houses.

Other initiatives which were already underway included some early experimentation with student project work, and the practice of site-based governance and decision making. Prior to 1994-1995 the school had a governance council and smaller "focus groups," which concentrated on

solving problems within specific categories: communication and school climate, curriculum and instruction, and student services and facilities.

The secondary school is an alternative high school housed at a former middle school with a staff of 6 teachers and 148 students. The middle school has 643 students and 34 teachers grouped in three separate "houses," served by 12 administrative and support personnel. Each house has its own decision-making process.

With the appointment of a new superintendent who is supportive of Co-NECT, there appears to be fairly strong district support for expansion of the program. Plans are being developed to add one or more elementary schools during 1995-1996, and to extend the high school program.

SITE C

An urban center with a population of about 85,000 people, during school year 1994-1995, operated a total of 25 schools and enrolled approximately 13,500 students. This included 16 elementary schools serving about 6,200, 5 middle schools serving about 3,300, and 4 high schools serving about 4,000. The district placed heavy emphasis on the inclusion of special education students and has bilingual programs serving approximately 350 students.

The Co-NECT middle school is located in the area characterized by its parks, residential neighborhoods and a historic Little Red Schoolhouse. Students come to school from a wide range of socioeconomic backgrounds. Homes range from single family dwellings to apartment complexes.

During the 1993-1994 school year, the school enrolled approximately 800 students, 26.5 percent of whom were minorities. The school has a low mobility rate. As many as 85 percent of the students who enrolled at the beginning of the 1993-1994 school year were still enrolled at the end of that year. Accompanying this low mobility rate, 91 percent of the students at the middle school attended school daily. While the school did not operate a full inclusion program, special education students attended both special education and regular classes.

The 64-member teaching staff includes teachers, aides and paraprofessionals. While none of the 12 teaching aides on the staff had obtained a B.A. degree, 37 of the remaining 52 faculty members possessed an M.A. or higher degree. About 38 percent of the teachers had practiced there for 20 or more years; 17 percent had practiced there for more than 10, but less than 20 years; 30 percent for 3-9 years; and, only 13 percent for less than 3 years.

The district has recently implemented an initiative aimed at giving teachers more decision-making responsibility, including the power to interview and choose the school's principal. The faculty selected the current principal in 1993. Thus, when the school adopted the Co-NECT project, the principal was only beginning his second year there.

3. DESCRIPTION OF IMPLEMENTATION LEVELS AND OUTCOMES

The Co-NECT design is based on five key elements: school-based design; performance assessment; project-based learning; a strong professional community; and access to the best available technology. In this section we look at each design element in turn and the degree to which it appears to have been implemented at the sites as of June 1995. The information pyramid format described in Appendix A is fully illustrated for the technology element on page 180. General descriptions of Co-NECT implementation levels and early progress for the other design elements are given here for interested readers. Broad student and school outcomes also are described.

SCHOOL-BASED DESIGN

Implementation Levels and Early Outcomes

The process of community-bound design begins with a shared vision. Local school design teams work with Co-NECT to tailor the basic design to local needs, goals, and resources. A Co-NECT school is autonomous, connected and accountable.

Although a shared community-wide vision is seen in Co-NECT as the force that drives the whole-school change process, our experience to date has been that change is more likely to be associated with the efforts of individuals (such as the building principal) or specific groups of teachers within a school. Ideally, the school design team, with support from a district team, sets school-wide policy, and supports the work of teaching teams for the individual clusters. In practice, one or more of these linkages is somehow faulty. The school design team, for example, may find itself operating without the full support of the district. Or the cluster teams may pursue independent agendas, shaped more by the personal philosophies of the cluster teachers than any larger, school-wide vision.

At Site B, a shared school-wide "vision" has been slow to emerge. The middle school and high school faculties do not meet regularly with each other, and thus do not have the kinds of ongoing conversations that help foster a common vision. Also, although the "house" structure at the middle school level has tended to encourage local decision-making, this may have come at the cost of a faculty-wide commitment to whole-school restructuring. Some houses have moved more slowly than others in fully and whole-heartedly adopting certain key elements of the Co-NECT design such as project-based learning and multiage grouping.

The situation is even more problematic at Site C. In addition to six different design teams working with the Co-NECT design (focusing separately on project design, staff development, scheduling, community, assessment and technology), Site C also has a "planning team" composed of five teachers, three parents, and the principal. The team was in place before Site C fully adopted the Co-NECT design, and it has concentrated its efforts heavily on how to implement this design as a pilot project of a school within a school. Unfortunately, the faculty is about equally divided between those who are relatively supportive of efforts to "implement" Co-NECT, and those who have attempted, with partial success, to block these efforts. As a result, and in spite of fairly strong parent support for Co-NECT, only half the school is working with the design as we go into 1995-1996.

Site A, which has been working with Co-NECT the longest, has what is probably the most mature and consistent sense of itself as a unique institution with a unique mission. A site visit by researchers from RAND Corporation in June found that the faculty now "speak the design language" and have taken steps on their own initiative to "promote the design and its implementation."

However, it must be noted that a questionnaire administered to the Site A faculty in June indicated mixed feelings about the degree to which there is a common vision, with only slightly more than half (56 percent) of faculty agreeing that the school community has a shared vision. It may be that teachers are interpreting the question to refer to the community as a whole (one comment referred to "negative feelings"

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in the outside community), or it may be that there is somewhat more divergence of opinion than may appear on the surface.

As a result of our experiences, we have now begun instituting a more detailed "Framework for Change" in which detailed mutual expectations for results are outlined in a phased approach to implementing the design.

PERFORMANCE ASSESSMENT

Implementation Levels and Early Outcomes

Co-NECT schools set high standards of performance for all students. Stated in concrete terms, the school's standards give administrators, teachers, students, and parents a strong sense of purpose and provide an authentic means of demonstrating progress from kindergarten through high school. A school also needs to set standards for its own performance as an institution of learning, monitoring its ability to provide all students with the opportunity to achieve high standards, and periodically reporting results to the community

Specifying performance standards, developing rubrics, and collecting models of student work is a long and involved process. Not surprisingly, at the end of the academic year 1994-1995, our sites were at different stages in this process, although all had done work.

Site A appears to have made the most progress. Working in teams, the faculty have been identifying performance standards for each level within the school: primary, intermediate, and advanced. For each performance standard, teachers have been defining assessment rubrics, and have begun to assemble a collection of work samples that illustrate exemplary work.

As hoped, the task of defining performance standards has encouraged the entire school community at Site A to think hard about what should be expected of students. One of the site's own documents puts it this way: "It [the process of developing performance standards] has forced us to focus not only on what we expect students to be able to do, but to make sure that there is a common understanding among all components of the school--students, parents, teachers, and the greater community--about what is meant by 'developing,' 'proficient,' and 'distinguished' work."

A report from a critical friends visit in November, 1994 confirms this view, citing evidence that the school had made progress in establishing portfolio standards and rubrics, but questions the extent

to which all students had managed to assimilate the rubrics. The faculty is fully aware that this part of the job is far from complete. When the design questionnaire was administered in the spring of 1995, only 48 percent of the faculty viewed this component of the design as fully implemented.

The critical friends program has been widely viewed as successful, at least by those who have been most directly involved. Participants report that they gain insight into their own practices by viewing other teachers at work. Although members of host school faculties are likely to claim that the reports "contain nothing we didn't already know," they also typically acknowledge that the inventory of strengths and challenges is "something we needed to hear."

Anne Thomas, a teacher at the Scott Middle School, had this to say:

Since we are all involved in the Co-Nect design, the feedback is more valuable than if it came from an outside group. We know that our "critical friends" truly understand what it is that they are evaluating, and will give us the most honest feedback possible in order that we may improve our schools. The host school receives the feedback from the critical friends, which allows them to grow to meet their challenges, while the visiting sites are able to dialogue with all parties involved. It was through all of this dialoguing that people were able to share their ideas and concerns, and find that all parties involved share many of the same concerns and challenges.

A RAND report calls the Co-NECT Critical Friends program, with the follow-up video conferences a "very positive step," noting that the process allows the school faculty to "see itself in perspective" and to receive constructive criticism from valued colleagues representing other Co-NECT schools.

PROJECT-BASED LEARNING

Implementation Levels and Early Outcomes

Co-NECT students work on safe, interesting, and academically challenging projects during a significant portion of the school day. Projects provide opportunities for students to apply and develop basic skills, apply and extend interdisciplinary knowledge, collaborate and communicate, and construct new knowledge and understanding.

Not surprisingly, the quality of projects undertaken by Co-NECT teachers has varied. Certainly, there have been many ambitious, community-oriented projects. For example, at Site A students and teachers have been working with the local bar association to have high-powered crossbows classified as "lethal weapons." They've traveled to Washington for a private interview with the attorney general. At Site B students have worked in cooperation with the Forest Service and other agencies to create an on-line information service.

At the same time, while projects have become increasingly ambitious, and have led to authentic products and significant community involvement, there is a concern that too many of these projects still involve telling about phenomena on a superficial level, and too few involve true inquiry and analysis, leading to deep understanding of complex topics. For example, in November 1994 after visiting Site A, the Critical Friends team, while acknowledging that curriculum projects have helped foster a "strong oral culture and appropriate focus on group communication skills, public speaking, etc.," called for the school to work on developing a "sense-making culture" and to "improve understanding, application, and extension of knowledge." The Critical Friends report to Site C talked about the need for project work to "extend, refine, and apply interdisciplinary knowledge, invite curiosity, and generate inquiry."

Too often, projects at all three sites were: (a) viewed as supplemental (not a core curriculum activity); (b) focused on "making

things" (e.g., posters); (c) focused on representing information gleaned from a textbook or other such source; and (d) having limited audiences (e.g., the teacher, other students, parents). As a teacher at Site C put it, "We haven't built all curricular areas into projects yet. I believe our problem is our choice of topics. Only a few so far have been multidimensional."

A second and continuing concern has to do with the relationship between projects and "basic skills." One issue is whether or not students can learn, or be taught, basic skills such as reading, writing, and calculation in the context of projects. Although a fundamental principle underlying the project-based curriculum is the idea that projects provide meaningful and authentic context for developing basic skills, the Co-NECT design acknowledges that projects are not the only suitable context for learning and suggests that schools offer what the design refers to as "seminars" and "workshops."

Unfortunately, there is some evidence the sites have sometimes used this as a "loophole" in the design, providing a kind of sanctuary for traditional, teacher-centered instructional activities. The Critical Friends report on Site C, for example, stressed the need for "contexts in which students can acquire basic skills and the critical skills...in ways that are as interesting, engaging, and challenging as in their project work."

Although teachers and design team members have had reservations about the quality of projects, parent responses have generally been positive. The following statements, from parents at Site C, are typical:

My son did not have any idea where the library was for the past two and one half years. Now I have a problem keeping him out of the library in the evenings.

At about 11:00 one evening I walked into my daughter's bedroom. She had a flashlight on and was finishing her report on the Holocaust.

I believe this program is getting my son ready for the real work place in the real world.

In spite of initial concerns on the part of many teachers, another feature of the Co-NECT model for teaching and learning, multiage or multigrade grouping, has also been generally successful. A teacher at Site C reported: "Yes, we have extremely heterogeneous groups. This is a strong asset to the design. What a difference this had made." The difference comes from allowing students to play different roles and take on real responsibility. "Sixth graders are beginning to model more appropriate behavior. Eighth graders are adopting a nurturing attitude towards sixth and seventh grade students. Teachers feel that the multi-age grouping has encouraged our students to move ahead," says the principal at Site C.

PROFESSIONAL COMMUNITY

Implementation Levels and Early Outcomes

Teachers are the ultimate agents of change in any school. Teachers in a Co-NECT school direct their own professional development as part of the school design process. Teachers are organized in cross-disciplinary, cross-age clusters with professional decision-making responsibility, accountability, and common planning time. Professional development relies on networking, mentoring, classroom research, and identification of workable ideas and resources.

The creation of a sense of professional community--based on the formation of empowered, accountable cluster teams (teaching teams)--is one of the first things we look for in the early implementation of the design. In fact, in all of our sites, the building principals have worked hard to empower teachers and foster a sense of professionalism. Although these efforts have been largely successful, some teaching teams are (unsurprisingly) more "committed" than others.

At Site A, the cluster teams are firmly established as a key organizational component. The teams are scheduling events and seminars together, brainstorming ideas for projects and sometimes teaching them together, discussing and understanding the students in their clusters better, and learning about different approaches that they can take to manage and carry out their work. Most of the teachers are learning about different approaches that they can take to manage and carry out their work. Most of the teachers find this a novel experience, and voice strong approval for the teaming. They have reportedly found it an empowering experience: they control much of the curriculum, assessment, and scheduling.

At Site B, each of the four teaching teams has a unique dynamic and has developed differently. Teachers on one team formed (by some accounts) a tighter-knit group than teachers on the other teams. According to this view, this is the house in which the design has been

most fully adopted. Another team consists of a group of experienced teachers who were reportedly enthusiastic about the Co-NECT design, but who initially lacked a cohesiveness and sense of direction. Teachers on another team have moved even more slowly than the others in coming together as a team. As a result, the Co-NECT design is least fully "implemented" in this third house.

A fourth house, consisting of "specials" (i.e., teachers of music, life skills, the arts, health and physical well-being, technology sciences, etc.) did not have common planning time, and therefore had little opportunity (at first) to collaborate with other teachers in implementing the Co-NECT design. More recently, these teachers have reportedly begun to work together as a team and now collaborate with other teachers in the school on selected projects.

At Site C, where Co-NECT is viewed as an alternative "program," the Co-NECT teachers have formed a fairly cohesive team with empowerment and a unique identity as the "Co-NECT" teachers.

All in all, there is evidence that the emphasis on common planning time for teachers, the Co-NECT Critical Friends program, and faculty involvement in administration, scoring, and analysis of student portfolios and performance tests have resulted in an increased sense of professional community at all three of our Co-NECT sites.

- Using electronic mail, video teleconferencing, and the Co-NECT School Exchange, teachers and staff at all three schools had to communicate with each other, discuss issues of common concern, and plan joint projects.
- Teachers at all three sites were working hard to develop performance standards and incorporate them into curriculum and assessment activities. As a result, teachers are more focused on goals and progress toward goals.
- The Co-NECT Critical Friends program had a strong impact at all three sites. As a result of the visits, the schools have a more objective picture of both progress and remaining challenges. Teachers who have participated in the visits have

returned to their classrooms with new perspectives and a renewed commitment to improve their own teaching.

BEST AVAILABLE TECHNOLOGY

Implementation Levels and Early Outcomes

The Co-NECT design provides a vision of a technological infrastructure featuring unimpeded access to video equipment, computers and software tools for all members of the learning community, and a flexible communication network linking all computers in the school with each other, and with computers around the world.

- The full Co-NECT community came "on-line" in February 1995. Co-NECT teachers at all three sites now have email accounts, and are beginning to use email to communicate within the building and with colleagues at other Co-NECT schools. In addition, each site has its own Internet server, which means the site can create its own email accounts, set up and subscribe to news groups, and manage its own World Wide Web site.
- Co-NECT is becoming a "virtual" community. Our central information service, the Co-NECT Exchange (<http://co-nect.bbn.com>) now points to each of our partner sites, and makes some of our design documents available on line. In addition, email has enhanced our ability to communicate with key people at the sites and to respond to requests in a timely manner.
- The emergence of a true "technology culture" has been slow. At every site, there are now several teachers who are beginning to use computers for their own professional development, to locate resources on the Internet, and to communicate with colleagues in other schools. Using electronic mail, video teleconferencing, and the Co-NECT School Exchange, these teachers are beginning to communicate with each other, discuss issues of common concern, and plan joint projects.

- Students enjoy the emphasis on technology, and are beginning to learn how to use the new tools on their own, without direct instruction. There are many cases of students helping teachers learn to use the computers.
- Students appreciate the freedom and responsibility associated with the technology-based project-centered curriculum. They develop a sense of ownership over their project work that teachers do not see with a textbook-driven curriculum.
- There is a continuing concern that computers are only beginning to be used to improve the quality of learning for the average student. In particular, it seems that available mathematics and science software is being under utilized.
- Surveys indicate that parents are particularly happy with the increased opportunities for students to use technology and the school's project-based curriculum.

BEST TECHNOLOGY USE

Research and Additional Observations

The observations given above and described here draw on a variety of data sources including interviews with staff, reports from Critical Friends visits, a recent RAND report based on school site visits, and administrations of our Co-NECT design questionnaires to students, parents and staff members in 1994 and 1995. We also collected documentation on the numbers of computers available to students and staff, the numbers of network connections, and usage figures for program participants. We start with these data.

We began our partnering with current sites by trying to learn about community access to technology and about their network capabilities. Our site partners conducted inventories of equipment, software, and network connections. We tracked the data into the second year. At Site A the following resources were and now are available:

	1993/94	1994/95
Number of working computers in the school	137	183
Average student/computer ratio	1.3	1.3
Percent of computers placed in computer labs or other special rooms	10.2	7.6
Number of computers in the school networked to computers in other rooms		148
Number of computers in the school with direct Internet access		105

In 1994 and 1995, design questionnaires were administered to students (spring 1995), teachers (August 1994), and parents (fall 1994) at Co-NECT sites; surveys focused on support for design tenets and on design implementation levels. Instruments relied on combinations of open- and fixed-response questions. In their ratings of the 26 Co-NECT design elements, teachers at Site A said they strongly valued the design's emphasis on technology. Large numbers of staff (from 88 percent to 92 percent) said that (1) technology access for all students and teachers, (2) local area network capabilities, (3) desktop Internet connectivity, and (4) Co-NECT's notions about a school technology culture were important to them personally. In response to questions about the levels at which these design elements were implemented in their programs, between 58 percent and 81 percent of teachers (across elements) said these elements described their school.

At the same time, we collected information about the integration of technology with teaching and learning. We wanted to learn whether and to what extent students were using computers to collect information, analyze data, and present results. The school team reported that all students were using computers as part of their instructional program; similarly all teachers were using them as part of their professional work. In response to the surveys, while 89 percent of teachers said it was important to them that, where appropriate, computers and other technologies be well integrated into learning and teaching activities, 58 percent said such integration described their school.

Observations by the RAND site team, Critical Friends, and others provide additional information about the integration of technology with teaching and learning. Observers saw students beginning to help each other learn computer skills, students developing scripts, reading news,

conducting interviews, running cameras, and controlling Site Broadcasts. Critical Friends observers noted some challenges. They said the school needed to expand the software library in order to support students and help teachers with classroom management. Students need to learn productive use of existing software, beyond word processing. Further attention is needed to developing and implementing strategies for disseminating computer expertise among teachers and students. RAND's report, similarly, was somewhat critical of the degree to which computer technology has changed the educational experiences of students in the school; they said,

Observation of classes and discussions with staff did not reveal strong notions of how to use computer technology to effectively or significantly enhance educational experiences. The technology in the classrooms was being put to rather mundane uses . . . that did not live up to the . . . claim that computer technology has significant potential to change curriculum and approaches to learning.

Our discussion of technology use closes with a description of student and parent survey information. In response to open-ended survey questions about the things they most liked about their school, intermediate (29 percent) and advanced level (54 percent) students at Site A most frequently discussed computer and video technology. Likewise, parents most frequently gave technology, projects, and multi-age classes as project strengths. One or more of these was mentioned explicitly by 43 percent of the respondents. In response to a question about the most important things they had learned all year, students most often mentioned science and computers. Additionally, they said they liked the freedom and responsibility associated with the technology-based, project-centered curriculum. An interactive research project conducted by the students appears below.

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Tracking the Wolves Interactive Research Project

BROAD STUDENT AND SCHOOL OUTCOMES

At the end of 1994-1995, all three Co-NECT sites were beginning to see significant progress in a number of key areas, including: parent and community involvement, student engagement, and student performance. These results reflect the hard work of local principals, teachers, parents, students, and other community members.

Student Performance and Engagement

CSTEEP (the Center for the Study of Testing, Evaluation, and Educational Policy at Boston College) has been working with Co-NECT to track student performance in reading, writing, science, and math. The test battery includes items taken from the National Assessment of Educational Progress (NAEP) and the Urban District Assessment Consortium (UDAC).

- The CSTEEP battery was administered to a sample of students at Site A in the fall and spring of the first year of implementation (1993-1994) and again in spring 1995. At the intermediate level (grades 3-5), in all curriculum areas there was a significant increase in scores on the group performance items, all of which require students to work either in pairs or groups of three or four. On the NAEP reading items, scores rose from 32 percent correct in fall 1993 to 45 percent correct in spring 1994 to 47 percent in spring 1995.
- The results for the advanced level (grades 6-8) at Site A were mixed, but were superior to comparable schools on the group performance items. The median percentage correct on performance math tasks increased from 31 percent in fall 1993 and 49 percent in spring 1994 to 80 percent in spring 1995. For performance reading tasks, improvements were from 63 percent correct in fall 1993 and 65 percent in spring 1994 to 82 percent in spring 1995.

- At Site B, baseline performance was strong in comparison to national and/or urban comparative data, especially in the area of science. Additionally, unlike most schools that show poor performance on items requiring students to work together, baseline performance at Site B on cooperative items was also relatively strong. Despite strong baseline performance, performance in the spring on open-ended items showed noticeable improvement, particularly in the areas of mathematical problem solving and abstract thinking skills. However, a slight decrease in performance on reading items occurred.
- Teachers at Site C achieved their goal of improving students' abilities to work cooperatively. On a majority of math and science performance items, the percentage of students who successfully completed the task rose by at least 10 points from the baseline assessment in the fall of 1994 to the follow-up in the spring.
- Student scores on open-ended reading items rose at Site C as well. Whereas only 31 percent of the students that participated in the baseline assessment were able to construct meaning based on a passage they had read, during the follow-up assessment, 41 percent of participating students performed adequately on these items. On items that asked students to extend meaning, performance rose from 32 percent on the baseline assessment to 46 percent on the follow-up assessment.
- Two of the three sites (Site A and Site B) were reporting fewer student behavior problems and disciplinary incidents.
- Site A was designated one of six exemplary middle schools in New England by the New England League of Middle Schools in 1994-1995.

Parental Involvement and Support

At all three sites, there had been a marked increase in parent involvement and support for the schools' programs.

- At Site A, about 95 percent of parents were regularly attending parent-teacher conferences. About twenty parents were taking part in decision-making and policy review processes at the school. A parent was co-chairing the school governance council with the principal, and parents were outspoken advocates for Co-NECT at school committee hearings. Parents, after being trained in basic classroom management techniques, were also beginning to help out in the classroom, thus freeing teachers for planning and professional development activities.
- Site C also noticed a dramatic increase in parent support. Approximately 150 parents attended a PTSA forum held in February and voiced overwhelming endorsement for the Co-NECT Project.
- At Site B, parents are becoming actively involved in student project work, providing resources and lending support.

In parents' words,

My daughter feels that she is part of a family and for Hispanic parents and culture, this is an extremely important point.

I believe this program is getting my son ready for the real workplace in the real world.

Maybe adults can afford to wait for schools to improve, but children can't. I feel Co-NECT is giving my kids a chance for a better education now.

Community Support

The Co-NECT design calls for multiple, "two-way" relationships between the school and the community. In all of our schools, these kinds of relationships are already beginning to form.

- In conjunction with the project-centered curriculum, Site A has new relationships with a local science museum, medical center, the local police department, and several other institutions and businesses. As a result, an increasing number of citizens

advocate for the school to the school committee and city officials.

- Site B has also witnessed a significant increase in community agency involvement in conjunction with student projects. Agencies that have been involved with the school include the Forest Service, Alaska Discovery, Princess Tours, Public Health, the Fish and Game Service, and various local artists and writers.

4. SUMMARY OF PROGRESS, CHALLENGES AND RECOMMENDATIONS FOR FUTURE WORK

Unsurprisingly, our results after the first two years of implementation have been encouraging yet mixed. At the end of 1994-1995, all three of our sites were demonstrating significant changes in the way that teaching and learning was being organized, in the use of technology, in community relations, and in the way goals were being set and progress measured. Early achievements, measured in terms of student test scores, student engagement, parent satisfaction, and levels of community involvement, were encouraging.

At the same time, we have become acutely aware that we are dealing with complex, multilevel organizations, characterized by a large number of cultures and subcultures that exhibit varying degrees of compatibility. Although the culture of a given classroom is probably determined largely by the beliefs and accustomed practices of the teacher in charge, the tendency for the classrooms in a given school to display one kind of culture or another is influenced by the school culture, which is more or less open to influence by the dominant actors at that level--by the principals, assistant principals, and lead teachers. The behavior of these actors is in turn more or less influenced by key actors at the district level (notably, the superintendent) and also by members of the local community (business leaders, parents, members of the press).

From the point of view of results--what students actually learn--it's what goes on in individual classrooms that really matters. Ideally, the whole, multilevel organization works in concert and collaboration to ensure that students are learning what the community wants them to be learning.

In practice we find this is seldom the case. Different cultures and subcultures are often at odds, leading to friction, frustration, and missed opportunities. For example, as previously noted, Site C has split into two opposing groups of teachers, one "traditional" and one "progressive;" vocal parents have aligned themselves with the

progressive teachers; and although the principal is trying to institute schoolwide reforms, he does not appear to have strong support from the district. Both Site A and Site C have been plagued by a discrepancy between traditional, district-mandated testing programs and the kinds of innovations in teaching and learning the Co-NECT design promotes. When teachers and administrators are held accountable only for results on traditional multiple-choice tests, there is a strong incentive to focus narrowly on the kinds of outcomes that such tests measure.

Finally, at all three sites, one continues to find considerable variation in the quality of teaching and learning from one classroom to another. While some teachers are beginning to demonstrate "progressive" practices and beliefs--e.g., stressing the importance of higher-order thinking skills, frequently organizing students in groups, and promoting explanation and discussion as opposed to simple correct answers, others are still narrowly focused on "basic skills," organizing desks in rows facing the front, and doing most of the talking.

Projections call for the Co-NECT school network to expand to some 50 schools around the country within the next year, and to more than 200 schools by the turn of the century. As we scale up our activities to support this expanding community, two things seem certain. First, technology will continue to evolve and extend opportunities for collaborative work and learning, often in unexpected directions. Second, while the pace of educational reform may quicken, the frustrating gap between what is theoretically possible and what works in practice will continue to challenge even the best efforts at technology-supported educational restructuring. We look forward to working with our school partners, current and future, to narrow the gap between our collective vision of a new generation of American schools, and the daily realities of our existing ones.

5. PORTFOLIO APPENDICES⁴

⁴The following appendix materials serve to illustrate the types of documentation that might be included in a progress assessment portfolio. Because some Co-NECT results were preliminary at this writing, data descriptions corresponding to results reported in Section 3 of the portfolio were unavailable. A complete version of the reform portfolio would include test report from design-based and jurisdiction-sponsored assessments (with information about score scales and standards); data reports from teacher, student, and parent surveys; Critical Friends reports; lists of community partners; and so on.

Sample Co-NECT Critical Friends Report

The following report was submitted by a Co-NECT Critical Friends team on completion of a three-day visit with colleagues at one of our schools. The visit began with a workshop on Sunday afternoon, followed by a reception that evening hosted by teachers, parents, staff, and union representatives at the school. The critical friends team then visited the school, "shadowing" students, observing classes, and interviewing parents over a two-day period. On Tuesday afternoon the group met and prepared the following report, which represents the consensus view of all visiting nine teachers and the two facilitators.

The school is currently prioritizing the "challenges" identified below and will draw up an action plan to address them. The entire Co-NECT community stands behind the school's efforts to significantly improve the quality of teaching and learning at the school in ways suggested by this report.

Grouping

How is multi-age grouping working? Are students' needs being met?

Strengths	Challenges
Students report positive experiences with multi-age grouping, including opportunities to make new friends, and to take responsibility for helping other students.	
Many teachers seem to have adapted well to the mixed-age groups in projects and "specials" classes.	Teachers need to find ways to assess and meet the needs of different ability levels in all subject areas.
Students report that multi-age grouping creates a positive sense of family, and it is evident that this is really happening. (Though teachers and students should continue to discuss how multi-age grouping is working.)	Students need training in specific group skills so as to be productive and effective members of a team. Teachers need to monitor the structure and effectiveness of the group, and respond accordingly.

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Technology

In what ways are computer tools (such as spreadsheets and database programs) being used to support project work?

Strengths	Challenges
Thanks to strong district support, the school is well-equipped with computer hardware.	The school needs to expand its software library (including CD ROM) to support students and to help teachers with classroom management.
Students are eager to learn more about the technology and what they can do with it. There is strong parental support for increased use of technology.	Students need to learn productive uses of existing software, beyond simple word processing and playing of games.
Students are beginning to help each other learn computer skills.	The school needs to further develop and implement strategies for disseminating computer expertise among both teachers and students, and to encourage respect for and ethical use of technology by students.
Computers are starting to be integrated into project work, especially for word processing.	Use of calculators should be promoted throughout the curriculum, as specified by the NCTM standards. Other technologies, including video and telephone, should be made widely available for use by students and teachers.
	Desktop Internet access must be established immediately, allowing the school to become fully incorporated into the larger Co-NECT community.

Projects

How are students dealing with the independence and autonomy afforded by project work?

Strengths	Challenges
Most students enjoy the opportunity to take part in projects and are enthusiastic about them.	Students and teachers need to clarify essential questions in order to focus project work.
Teachers are learning to prepare students to be more autonomous through checklists and organization skills, such as goal-setting and planning.	Students need to master ethical and efficient research techniques. Independent student work needs to be carefully monitored by teachers to improve the quality of research skills and processes.
The scheduling framework is in place to support project work.	Project work needs to extend, refine, and apply interdisciplinary knowledge, invite curiosity, and generate inquiry.
Teachers have begun to design and implement projects that extend the learning environment into lives and institutions outside the school walls.	Project work needs to extend beyond the school day, with homework as an integral part of the process.
Teachers have invited help in developing projects that go beyond simple processing of information.	Teachers and students need to build project organization skills, so that all students may contribute actively and productively.
Students are engaged in the projects, generating some of their own questions, and are beginning to develop a sense of purpose.	Students need to develop ownership of their projects, and see how projects are connected to their own lives and futures.
	The school needs to develop clearly defined standards, rubrics, and models of successful project work.

Co-NECT School Design Guide

Traditional Coursework

What appears to be the purpose and focus of "seminars?"

Strengths	Challenges
Teachers recognize the need to help students develop basic skills that will support them in their project work.	Teachers need to create contexts in which students can acquire basic skills and critical skills (as defined in the Co-NECT design guide) in ways that are as interesting, engaging, and challenging as in their project work.
The school has responded to community requests for students to pursue advanced work.	
Teachers are beginning to connect basic skills and project work.	Students need to be encouraged to ask challenging questions and monitor their own understanding.
	The school needs to develop a standards-based assessment system that will shift focus away from tests and grades.
	Teachers need to facilitate and organize classes to maximize time on task and active engagement.

School Community

What kinds of relationships seem to be developing among teachers and students? Among teachers?

Strengths	Challenges
Parents demonstrate an understanding of the Co-NECT model and urgently support the program, including its extension into the high school.	Parents need to be given opportunities to participate more actively in the school community and the change process.
Relationships between students and teachers are warm and informal, especially outside of the classroom and during project work.	
Students seem to enjoy and benefit from their "advisory groups." Many teachers advocate for individual students, (e.g., when they have scheduling problems), and recognize individual student effort.	The school needs to design a system of advisories that gives every student regular contact with a personal advocate over an extended period of time.
Specialists are beginning to collaborate with teachers on projects.	
Most students have a genuine respect for teachers and staff.	
Teachers' relationships with each other form a strong foundation of support and encouragement for continuing professional growth.	

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